Optimising opportunities for STI testing for men: exploring the acceptability of different testing venues with a focus on football club-based testing

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ABSTRACT

Background: *Chlamydia trachomatis* is the commonest curable sexually transmitted infection in the UK. The prevalence is shared equally by men and women. A National Chlamydia Screening Programme (NCSP) has been introduced in England, supported by advances in testing technologies which enable non-invasive sampling methods to be used in non-healthcare settings. The NCSP tests nearly twice as many women as men and is more likely to test men in non-healthcare settings. Men are seen as an important, but difficult to reach group. Little is known about where men prefer to access testing and whether or not non-traditional settings, such as football clubs, are acceptable.

Methods: 1) A national stratified random probability sample survey of men aged between 18 and 35 years resident in Great Britain, exploring attitudes to self-collected testing for Chlamydia, acceptability of venues to collect testing kits, health seeking and sexual risk behaviours. 2) Qualitative interviews with men who play amateur football. It explores the acceptability of three different, club-based, testing pathways; Health-care professional promoted; Peer-led promoted; and poster-led promoted.

Results: Men are well engaged with existing health services and find self-collected testing kits for Chlamydia highly acceptable. Healthcare settings are the most acceptable venues to access testing although sports settings are acceptable to a minority. Attitudes to testing in football clubs are influenced by factors relating

to men's characteristics, promoter characteristics and the impact of testing on time and effort involved.

Conclusions: Whilst non-healthcare settings can be used to reach some men for Chlamydia testing, existing services are already well accessed and offer considerable opportunities to test more men. More should be done to ensure men are able to access testing within the context of daily living, without significantly impacting on the time needed to pursue their main interests.

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ACKNOWLEDGEMENTS

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Finally, thank you to Stephen. I could not have done this without you.

THESIS OUTPUTS

Articles in Peer Reviewed Journals

Saunders JM, Hart G, Estcourt CS. Is asymptomatic non-chlamydial non-gonococcal urethritis associated with significant clinical consequences in men and their sexual partners: a systematic review. *Int J STD AIDS* 2011;**22**:338-341. (Saunders, Hart *et al.* 2011)

Saunders JM, Mercer CH, Sutcliffe LJ*, et al.* Where do young men want to access STI screening? A stratified random probability sample survey of young men in Great Britain. *Sex Transm Infect* 2012;88(6):427-32. (Saunders, Mercer *et al.* 2012)

Saunders JM, Mercer CH, Sutcliffe LJ, Cassell JA, Estcourt CS. Factors associated with asymptomatic non-chlamydial non-gonococcal urethritis in heterosexual men: findings from a case-control study. *Int J STD AIDS* 2013;24(8):627-31. (Saunders, Mercer *et al.* 2013)

Oral Presentations at International Conferences

Saunders J, Mercer CM, Sutcliffe L, Estcourt CS. Asymptomatic Non-Chlamydial Non-Gonococcal Urethritis is associated with high sexual risk: Symptom based triage misses men at high risk for STIs. Oral presentation; IUSTI Europe Congress; Tbilisi, Georgia; 2010

Poster Presentations at International Conferences

White P, Birger R, **Saunders J,** Estcourt C, Hallett T, Caffrey O, Mercer C, Roberts T. Is urethral smear microscopy In asymptomatic men effective in reducing Major *M genitalium* infection sequelae in women? *Sex Transm Infect* 2011;**87**:A293 doi:10.1136/sextrans-2011-050108.469 (White, Birger *et al.* 2011)

Estcourt C, **Saunders J,** Mercer C, Sutcliffe L, Hart G. Exploring the acceptability of medical, educational and sport settings for STI screening: stratified random probability survey of young men in the UK. *Sex Transm Infect* 2011;**87**:A342 doi:10.1136/sextrans-2011-050108.596 (Estcourt, Saunders *et al.* 2011)

Caffrey O, **Saunders J,** Estcourt C, Birger R, White P, Roberts T. Is abandoning urethral smear microscopy for the detection of non-gonococcal non-chlamydial urethritis in asymptomatic men a cost effective strategy? *Sex Transm Infect* 2011;**87**:A345 doi:10.1136/sextrans-2011-050108.60 (Caffrey, Saunders *et al.* 2011)

Poster Presentations at National Conferences

Saunders JM, Sutcliffe LJ, Hart G, Estcourt CS. The Acceptability of Using Soccer Clubs as Venues for Chlamydia Screening in Young Men: Results from a Qualitative Study. BASHH/ASTDA 2012, Brighton.

Letters in Peer Reviewed Journals

Saunders JM. Response to Li. *et al.*: Evaluation of a school-based HIV/ AIDS peer-led prevention programme. *Int J STD AIDS* 2010;**21**:786-788. (Saunders 2010)

THESIS BIOGRAPHY

The body of work in this thesis forms part of a programme of research into men's sexual health funded by the National Institute for Health Research. This five year programme grant, led by Dr Claudia Estcourt, consists of a number of interlocking and related studies, two of which are presented here. During my time working as a PhD student I was involved in other studies within this programme of research. Most significantly this included a large piece of work exploring the clinical significance of asymptomatic non-chlamydial, non-gonococcal urethritis (NCNGU) and whether or not sexual health professionals should continue to look for the condition.

From the beginning of the PhD process, it was intended that this work into asymptomatic NCNGU would be included in the final thesis. However, as time went on it became increasingly clear that the work did not sit well within the overall narrative of the thesis. For this reason, after initial drafts of the thesis which included this work, it was decided to remove it and place it within the appendix.

There are two distinct pieces of work. The first is a systematic review of whether or not asymptomatic NCNGU is associated with any adverse clinical outcomes for men with the condition or their sex partners. This found that there was insufficient high quality evidence to answer this question. The second study was a case control study of factors associated with NCNGU among asymptomatic men

attending one of two inner-London sexual health clinics. This found that men with asymptomatic NCNGU reported very similar risk factors to men with symptomatic NCNGU, suggesting that these men are at equivalent risk of acquiring a sexual infection. Both of these studies have been published in peer reviewed journals and the case control study has also been presented as an oral presentation at an international conference. Data from these studies also fed into modelling work which has also been presented in poster form at international conferences. References to all these outputs are included in the outputs section.

INTRODUCTION

1. Sexually transmitted infections (STIs) as a public health issue

Over the past decade there has been a sustained rise in the number of most sexually transmitted infections (STI) diagnosed among young people in the United Kingdom (UK) despite efforts to reduce transmission (Health Protection Agency 2012). Over the same time period, testing for sexually transmitted organisms such as *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (GC) has become much easier following the introduction of new tests which can be carried out on minimally invasive samples such as urine and self taken vulvo-vaginal swabs, which may explain why more infections are being diagnosed. (British Association for Sexual Health and HIV 2010). Therefore, whilst increased number of diagnosed infections may not truly represent a decline in the population's sexual health many infections go unnoticed because they do not cause symptoms (Holmes, Sparling *et al.* 2008). Therefore, whilst the majority of STIs can be easily detected and cured with antibiotics, many people with infections still remain untested and untreated. Untreated STIs can cause infertility and ectopic pregnancy, chronic pelvic pain, pelvic inflammatory disease in women as well as epididymo-orchitis, arthritis and infertility in men (Holmes, Sparling *et al.* 2008). The resulting reproductive health sequelae of untreated infections cost the National Health Service (NHS) an estimated £100 million in 1998 and although this is likely to be significantly higher over recent years it has not been possible to calculate the current costs (Department of Health 1998;Department of Health 2009).

2. Current screening strategies fail to reach men

In response to the poor sexual health of young people in the UK, the White Paper "Choosing Health" highlighted the importance of STIs at a national level (Department of Health 2005). In 2003 a National Chlamydia Screening Programme (NCSP) was introduced in England with the objective "*...of controlling chlamydia through the early detection and treatment of asymptomatic infection, thus preventing the development of sequelae and reducing onward disease transmission.*" (National Chlamydia Screening Programme 2012) Although the main health burdens of untreated infection are in women of childbearing age, the prevalence of chlamydia is not significantly different between men and women. However, national strategies to find and treat young people with Chlamydia have largely directed resources at screening women with subsequent testing and treatment in male sexual partners as part of partner notification. Whilst the cost effectiveness of screening more men is debated, it is largely accepted that more men need to be engaged in STI screening. Because repeat infection with Chlamydia is associated with an increasing risk of infertility, screening more men is beneficial to the reproductive health of women by preventing re-infection. Furthermore, it could also address important negative social implications of inequity in screening.

3. When men are screened, the majority are done in non-traditional settings

New non-invasive testing technologies adopted in the NCSP allow for screening to occur in non clinical settings because trained clinical staff are not required in order to collect suitable specimens for testing. The NCSP tests twice as many women as men (National Chlamydia Screening Programme 2011), but the settings

in which tests are done differ significantly between men and women. Three quarters of the men are tested in non healthcare settings compared to half of women tested (National Chlamydia Screening Programme 2011). This may reflect the fact that women are thought to be more likely than men to access traditional healthcare venues for other health needs. However, it is not known which settings are most acceptable to men for screening or how best to encourage men to engage in opportunities for STI screening. Models of screening in non clinical settings also vary widely with most NCSP testing being facilitated by health care professionals (doctors, nurses and sexual health advisors) with associated financial costs.

Alternative methods for encouraging target populations to test include using key members from within the target population community - peers or community popular opinion leaders (cPOL) - to facilitate testing. This has been used fairly extensively in an attempt to change sexual behaviour and increase HIV testing in some groups but its utility in chlamydia testing is poorly understood. Potential advantages of using cPOLs relate to lower staffing costs and an increased uptake of testing and thus warrant further rigorous exploration.

4. Other strategies to improve Chlamydia detection rates in young men

Increasing testing rates alone is not sufficient to improve Chlamydia detection rates, as some populations will have low levels of infection. Testing large numbers of men and women with a low prevalence of infection is costly and time consuming and, ultimately, may be a waste of resources. Therefore it is important to test the right populations (high prevalence), in the right place (settings where

uptake of testing will be high), and at the right time (before infection can cause damage or be transmitted).

Currently there is evidence to suggest lower detection rates of Chlamydia in men tested in outreach settings compared to those tested in healthcare venues. (Johnson, Simms *et al.* 2010) Previous NCSP testing targets depended on number of tests performed, incentivising local screening offices to perform large numbers of tests regardless of how many infections were detected. More recently, public health outcomes use a target for number of infections detected in an attempt to increase the impact of the screening programme. (Department of Health 2013)

Detecting a single infection in an individual is only the beginning when it comes to effective STI control. Contact tracing and partner notification (PN) is crucial to detect other infections among sexual partners and for preventing re-infection of treated index cases. National guidelines exist for suggested partner notification standards although these are not always reached. (British Association for Sexual Health and HIV 2010) Some researchers have suggested that increasing the proportion of sex partners treated would be more cost effective than increasing testing rates in men whilst others have highlighted the potentially important and negative social implications of targeting women for testing rather than increasing access to tests for men. (Turner, Adams *et al.* 2011) (Duncan and Hart 1999b)

However, PN is accepted as an important part of STI control and can improve the effectiveness of a screening programme as partners of those who test positive will be more likely to test positive themselves. Overall effective PN has the potential

to improve the diagnostic rates and effectiveness of a screening programme. It may also allow men to access testing as an asymptomatic contact of Chlamydia when they may not seek testing otherwise. Therefore, good PN benefits men and women by reducing re-infection in women (an important driver of infertility) and detecting new cases in men as well as potentially engaging men with sexual health services per se.

Conclusion

STIs are an important public health issue for men as well as women. However, current screening strategies fail to reach adequate numbers of men for effective STI control. Furthermore, there is a disproportionate use of non-traditional settings for male STI testing. The acceptability of STI testing amongst men of different settings is not known and the use of non-healthcare professionals to engage men in Chlamydia testing is poorly studied. STIs continue to be a significant public health problem in the UK and globally despite extensive and costly efforts to find and treat infections. Whilst technological advances have increased testing options they have often been implemented in non-clinical settings without consideration of their acceptability.

This research will help to fill the evidence gap in determining optimal strategies for STI screening in men by:

1. Determining which venues are acceptable to young men for accessing STI testing, given that men are currently considered hard to reach and account for only a third of tests within existing strategies;

2. Investigating new ways to engage men with STI screening by exploring the potential role of using popular opinion leaders in sport settings to promote STI screening.

Research Objectives:

1. to determine within which medical, recreational and social venues young men find it acceptable to access STI testing;

2. to determine whether young men find it acceptable to use self-collected, non-invasive tests for chlamydia;

3. to determine the acceptability of using popular opinion leaders to encourage young men to test for STIs in sport settings;

This thesis is comprised of two pieces of original research:

1. A stratified random probability sample survey of men aged 18 to 35 years and resident in Great Britain (Chapter 4);

2. Qualitative interviews with men who play amateur football (Chapters 5 and 6);

Chapter 1: Background

This chapter contains a background to sexual health in the UK, focusing on the problem in men and setting the scene for the body of research in this thesis. It also includes a background to the potential use of popular opinion leaders and sport in STI testing and the impact of gender and masculinity.

Chapter 2: Literature Review

In this chapter I review the current literature on barriers to testing men for STIs and the use of popular opinion leaders and sport settings to encourage screening among men. Also contained in this chapter is a discussion of the relevant theory related to popular opinion leaders.

Chapter 3: Methods

The methods chapter contains an overview of the methodology for the stratified random probability sample survey and qualitative interviews.

Chapter 4: Where do men want to access test kits for Chlamydia?

This chapter contains the results of the stratified random probability sample survey. The main findings were that men find it highly acceptable to use self-collected testing kits for Chlamydia and that General Practice settings are the most acceptable venues to pick up these testing kits. Furthermore, three-quarters of men who participated in the survey had seen their GP within the last twelve months meaning that there are significant opportunities to engage men in Chlamydia testing in General Practice.

Outputs from this study are:

1. Estcourt C, **Saunders J,** Mercer C, Sutcliffe L, Hart G. Exploring the acceptability of medical, educational and sport settings for STI screening: stratified random probability survey of young men in the UK. *Sex Transm Infect* 2011;**87**:A342 doi:10.1136/sextrans-2011-050108.596 (Estcourt, Saunders *et al.* 2011)

2. **Saunders, J. M.**, C. H. Mercer, L. J. Sutcliffe, G. J. Hart, J. Cassell and C. S. Estcourt. "Where do young men want to access STI screening? A stratified random probability sample survey of young men in Great Britain." Sex Transm Infect **88**(6): 427-432. (Saunders, Mercer *et al.* 2012)

Chapter 5: Social context for young men who play football

This chapter contains results from the qualitative interviews relating to the social context for young men who play football. It examines why young men engage with football clubs and how this may impact on the feasibility of offering testing in these settings.

Chapter 6: Practical considerations for delivering Chlamydia testing in football clubs

This chapter contains results from the qualitative interviews relating to how best to deliver testing in football clubs.

Outputs from this chapter are:

1. **Saunders JM**, Sutcliffe LJ, Hart G, Estcourt CS. The Acceptability of Using Soccer Clubs as Venues for Chlamydia Screening in Young Men: Results from a Qualitative Study. BASHH/ASTDA 2012, Brighton.

Chapter 7: Conclusions

This chapter contains an overall discussion of the studies, conclusions and recommendations.

Chapter 1: BACKGROUND

Here I present a background to sexual health in the United Kingdom (UK). This includes an outline of the epidemiology, diagnosis and treatment of sexually transmitted infections (STI) of relevance to this thesis and the impact of changes in national sexual health policies on these. This thesis focusses on men's sexual health and the issues involved in engaging them with sexual healthcare. Therefore, whilst a general overview of the problems are presented, wherever relevant, their specific impact on men is covered in more detail in sections below and are the focus of the discussion.

Sexually Transmitted Infections

What are STIs?

Sexually transmitted infections (STI) are bacteria, viruses, protozoa and infestations that are transmitted and acquired primarily through sexual contact between individuals. However, some STIs may also be transmitted from mother to child, either in-utero or around the time of delivery (vertical transmission), or have other routes of transmission that are not necessarily considered as sexual, for example, through contaminated blood products and skin to skin contact (Holmes, Sparling *et al.* 2008). STIs contribute to significant morbidity and mortality worldwide with an estimated 448 million new infections of syphilis, gonorrhoea, chlamydia and trichomoniasis occurring annually and being responsible for

significant numbers of stillbirths, neonatal deaths and infertility (World Health Organisation 2011).

Prevalence of bacterial and non-bacterial STIs in England

The most common non-viral STIs in England are *Chlamydia trachomatis* (Chlamydia) (206,912 reported infections in 2012) and *Neisseria gonorrhoeae* (Gonorrhoea) (25,525 reported infections in 2012 representing a 21% rise on the previous year) (Health Protection Agency 2012) (last accessed 30th December 2013). More diagnoses of Chlamydia were made in women during 2012 with 118,988 diagnoses in women and 85,685 infections (41% of all diagnoses) diagnosed in men during that year. Gonorrhoea, however, is more likely to be diagnosed among men. Men accounted for 73% of all gonorrhoea diagnoses in 2012, a 23% increase on the previous year. This is probably because of a number of factors. Firstly, urethral gonorrhoea is more likely to present with symptoms than cervical infection and, secondly, because men who have sex with men are disproportionately affected by gonorrhoea with infection commonly found at pharyngeal, rectal and urethral sites (Health Protection Agency 2012).

A condition in men known as non-chlamydial non-gonococcal urethritis (NCNGU) (52,511 [figure taken from "non specific genital infection"] cases in 2012 representing a 3% decline on the previous year) is considered sexually transmitted and has multiple possible causes (discussed below) (Health Protection Agency 2012). Viral STIs are also common among men in England with 12,152 first episodes of genital herpes (herpes simplex virus types 1 and 2) and 40,392

first episodes of genital warts (human papilloma virus) diagnosed in men in 2012 (Health Protection Agency 2012;Health Protection Agency 2012).

Overall there has been a 1% rise in the number of new STI diagnoses (excluding Chlamydia) in men in the period 2011-2012 and a 4% rise from 2003 to 2012 (Health Protection Agency 2012). Whilst this rise has been seen in all age groups and in women as well as men, several key population subgroups are disproportionately affected. These include men who have sex with men (MSM), women aged 15 to 19 and men aged 20 to 24. The control of STIs is of such public health importance that access to free testing for any STI and free treatment of acute STIs is not limited to UK tax payers in an attempt to aid STI control. However, the precise make up of the group of infections considered to be sexually transmitted changes over time as a result of expert opinion and advances in medical knowledge. These changes are reflected in testing guidelines and may have an important impact on public health (see discussion below).

Transmission dynamics

Sexual behaviour

Several key factors are responsible for facilitating the spread of STIs (Holmes, Sparling *et al.* 2008). Firstly, as STIs are predominantly transmitted through sexual contact, the rate of sex partner change is important. Included in this is the possibility of overlapping sexual partners (concurrency). Secondly, the use of condoms is important as their correct and consistent use has been shown to reduce the risk of acquiring STIs.

Characteristics of the infectious agents

Two other factors that impact on transmission dynamics are related to the infections themselves rather than sexual behaviours. Firstly, not all infectious diseases are as infectious, or easy to transmit, as others. For example, influenza and measles are highly contagious infectious and require relatively little exposure by a susceptible individual for infection to take place (Farrington, Kanaan *et al.* 2001). In contrast, gonorrhoea is a much less infectious organism (BRUNHAM, NAGELKERKE *et al.* 1994). HIV is even less infectious with the estimated chance of infection for a woman following a single episode of unprotected vaginal intercourse with an HIV infected man between one and two in a thousand (Benn, Fisher *et al.* 2011). Therefore the likelihood of acquiring an STI depends, in part, on the STI to which one is exposed.

Likelihood of STI to cause symptoms

Secondly, the likelihood of an STI to cause symptoms in an individual has an impact on the transmission probability. Those infections which quickly cause noticeable symptoms have less opportunities to be passed on as infected individuals may choose to change their sexual behaviour and seek more prompt health care. Conversely, infections which do not cause symptoms and remain unnoticed (asymptomatic) have a greater opportunity for transmission. However, there is some evolving evidence to suggest that individuals who suspect they have an STI may continue to have sex up until the time they have been treated (Olonilua, Ross *et al.* 2008). Individuals without symptoms are unlikely to know

they have the infection until detected through opportunistic testing. Many STIs are capable of establishing infection without causing noticeable symptoms (see sections below) (Holmes, Sparling *et al.* 2008).

It is the asymptomatic nature of many infections which is particularly responsible for several specific challenges in coordinating a public health response to the high numbers of infections. People at risk of infections may be unaware that infections are often asymptomatic and therefore unaware that they are at risk or require screening. As symptoms may be a major motivator for men and women to seek health care, the asymptomatic nature of some infections has the potential to increase the duration of infection and facilitate onward transmission. Encouraging people to proactively seek health care for any asymptomatic condition is challenging. In addition to this, the stigmatising nature of sexual infections makes engaging men and women in screening even more difficult. Because the duration of infection is correlated with the transmission of that infection, timely diagnosis and treatment is critical in controlling epidemics and is the cornerstone of public health efforts to improve sexual health in the UK.

Basic reproduction number

These concepts help to inform a measure known as the basic reproduction number (R_0). This is defined as the number of cases one case generates on average over the course of their infectious period (Pagel 2002). When $R_0<1$ the infection is producing less cases than is necessary to continue as an infectious agent in the population. When $R_0>1$ then the infection will spread to greater number of people

within the population. The basic reproduction number is affected by the factors outlines above; how infectious the organism is, the duration of infection within an individual (i.e. the longer you are infected the more people you can infect), and the number of people in the population who are susceptible to the infection (i.e. are some people immune naturally or through vaccination programmes). For the majority of sexually transmitted infections, their asymptomatic nature potentially allows for long periods of unnoticed infection which drives up R_0.

$R_0 = t \times c \times d$

t = transmissibility, c = the average rate of contact between susceptible and infected individuals, d = the duration of infectiousness

Specific STIs

The following section contains a brief overview of the STIs of relevance to this thesis.

Chlamydia trachomatis

Background

Chlamydia trachomatis (*C. trachomatis)* is a non-motile, gram-negative obligate intracellular bacterium and causes the disease known as Chlamydia. It primarily causes diseases affecting mucosal membranes at the site of infection although is also responsible for skin, eye and joint disease in susceptible individuals (Holmes, Sparling *et al.* 2008). *C. trachomatis* is assigned to different serovars according to

variations in the organism's major outer membrane proteins (MOMP) (Holmes, Sparling *et al.* 2008). These different serovars of *C. trachomatis* cause a range of disease; Trachoma, a disease of the eyes, caused by serovars A to C; sexually transmitted ocular-genital infections caused by serovars D to K (with E being the most common type in the UK); and *Lymphogranuloma venereum* (LGV) caused by the L1 to 3 serovars (Holmes, Sparling *et al.* 2008). For the purposes of this thesis, "Chlamydia" will refer to only to disease cause by the *C. trachomatis* serovars D to K unless otherwise stated.

Pathology

C. trachomatis can cause disease at a variety of mucosal sites including the eye, oropharynx, cervix, urethra, rectum, epididymis, and pelvic organs (Holmes, Sparling *et al.* 2008). The presence of symptoms depends, in part, on the site of infection. For example, the most commonly infected sites in men and women are the urethra and cervix respectively with symptoms only reported in 50% and 30% of infections at those sites (Holmes, Sparling *et al.* 2008). In contrast, chlamydial infection of the oropharynx and rectum is rarely symptomatic. When present, symptoms are caused by the associated mucosal inflammatory response at that site. So, for example, infection of the urethral mucosa can cause symptoms of urethral discharge, dysuria (pain on urination) and penile itching or irritation, as a result of urethral inflammation known as urethritis (Holmes, Sparling *et al.* 2008). In women, cervical infection may present with symptoms of cervicitis (inflammation of the cervix); abnormal discharge, bleeding between periods and bleeding after sexual intercourse (Holmes, Sparling *et al.* 2008). However, the presence of

inflammation alone is not enough to cause symptoms and both urethritis and cervicitis may be present without an infected individual experiencing symptoms.

Without treatment, *C. trachomatis* may cause a variety of both serious and uncomfortable conditions (Holmes, Sparling *et al.* 2008). In men these include inflammation of the epididymis (epididymitis) and testes (orchitis or epididymo-orchitis), inflammation of the joints (arthritis) and conjunctiva (conjunctivitis). Furthermore, there is some evidence that *C.trachomatis* and urethritis may affect fertility in men as a result of testicular inflammation in orchitis as well as from a direct effect on sperm function (Carne, Chilcott *et al.* 2012). In women, ascending infection from the cervix can lead to infection and inflammation of the endometrium (endometritis), fallopian tubes (salpingitis) and pelvic and abdominal organs (pelvic inflammatory disease and perihepatitis) (Holmes, Sparling *et al.* 2008). Not only can these complications cause chronic pelvic pain, but they are also responsible for ectopic pregnancies and infertility (Holmes, Sparling *et al.* 2008) which cost the National Health Service (NHS) an estimated £100 million (Aghaizu, Adams *et al.* 2011). Infection with *C. trachomatis* during pregnancy can have a number of significant adverse effects for the mother and neonate. These include pre-term delivery and perinatal infection of the neonatal conjunctivae (Ophthalmia neonatorum) and lungs causing pneumonia.

Diagnosis

Chlamydia is diagnosed by the demonstration of *Chlamydia trachomatis* at the site tested. In the past this relied on culture and/ or ELISA (Enzyme-linked immunosorbant assay) techniques which were costly and time consuming. This

has been superseded with polymerase chain reaction (PCR) techniques which use genetic primers to amplify sections of chlamydial proteins in suitable samples. These newer techniques have many advantages over older methods. They are highly sensitive and specific, require minimal genetic material to be present in order to get a positive result, are cheaper to conduct, use automated machines that can process high volumes of samples without the need for more highly trained staff, and can use samples gained from self-collected or minimally invasive techniques taken in non-healthcare settings (urine and self collected swabs) (British Association for Sexual Health and HIV 2010). These benefits of PCR techniques have paved the way for the development of screening programmes in non-clinical settings.

Treatment & Management

Chlamydia is treated with oral antibiotics (British Association for Sexual Health and HIV 2010). A variety of antimicrobials have activity against *C. trachomatis* but single dose Azithromycin is most commonly used in the UK because of its efficacy, cost, favourable side effect profile and ease of use (British Association for Sexual Health and HIV 2010). Doxycycline taken twice a day for a week is less expensive than and possibly more efficacious than single dose Azithromycin in head to head clinical trials although previously it was thought that there was no significant difference between the two agents (Lau and Qureshi 2002;Schwebke, Rompalo *et al.* 2011). However, issues with adherence to a week long course of therapy mean that Azithromycin is favoured in most settings. Whilst it is possible to demonstrate in-vitro chlamydial resistance to antibiotics, the clinical significance of this is currently unknown as true treatment failure has not been

convincingly demonstrated due to resistance in vivo (Horner 2012). Erythromycin and amoxicillin are other options in patients with allergy and pregnancy but are not recommended as first line treatment in UK guidelines (British Association for Sexual Health and HIV 2010).

Failure of treatment for any curable STI is most commonly associated with non-adherence to therapy or re-infection from an untreated sex partner rather than true treatment failure. For this reason, identification, testing and treatment of sex partners is a crucial component of STI management. This process is known as contact tracing and partner notification. Nationally rates of partner notification are low and vary widely with 43% of specialist clinics outside London meeting the standard of >/=0.6 contacts seen per index case, and 85% of clinics in London meeting the standard of >/0.4 contacts per index case (McClean, Carne *et al.* 2012). Abstinence from sex with untreated partners or any new partners until completion of treatment or a week after taking treatment (whichever is longest) is also advocated to limit reinfection and onwards transmission (British Association for Sexual Health and HIV 2010).

Neisseria gonorrhoeae

Background

Neisseria gonorrhoeae (*N. gonorrhoeae*) is the bacterium that causes the disease known as gonorrhoea (Holmes, Sparling *et al.* 2008). It is a gram negative intracellular diplococcus (GNIDC) and able to establish infection at a number of different mucosal membrane sites, such as the oro-pharynx, urethra, endocervix

and rectum, as well as spread through the blood to skin and joints (Holmes, Sparling *et al.* 2008).

Pathology

As with *C. trachomatis*, it is possible to have *N. gonorrhoeae* at different mucosal sites, depending on sexual practices and exposure (Holmes, Sparling *et al.* 2008). However, unlike *C. trachomatis*, infection of the urethra and cervix is more likely to be accompanied by symptoms (Holmes, Sparling *et al.* 2008). Around 90% of men with urethral gonorrhoea will have symptoms, most commonly purulent urethral discharge and discomfort when passing urine. Untreated infection in men can lead to epididymitis, orchitis, epididymo-orchitis, arthritis, and a variety of more serious, but rarely seen, locally destructive conditions (Bignell and Fitzgerald 2011). In women gonorrhoea can cause reproductive morbidity similar to that seen with Chlamydia (Holmes, Sparling *et al.* 2008). *N. gonorrhoeae* can also enter the blood stream and infect the skin and joints, a condition known as disseminated gonococcal infection. Direct inoculation of the conjunctiva is also possible and ocular infection can lead to blindness. Infection with *N. gonorrhoeae* during pregnancy can lead to pre-term delivery and infection of the neonatal conjunctiva.

Diagnosis

Gonorrhoea is diagnosed by demonstrating the presence of the organism *N. gonorrhoeae* at the site tested. Traditionally this has been by examination of a Gram stained sample from the infected site using light microscopy with

demonstration of the presence of GNIDC, or by culture of the organism on selective culture medium (Bignell and Fitzgerald 2011). More recently, as with *C. trachomatis* detection, PCR techniques have been utilised for the diagnosis of gonorrhoea. However, sensitivities and specificities are not as good as for *C. trachomatis* PCR and this can lead to problems with false positive test results, especially when screening low prevalence populations (Bignell and Fitzgerald 2011). The presence of non-pathogenic commensal neisseria at tested sites can interfere with test performance (Bignell and Fitzgerald 2011). For these reasons it is important to confirm diagnosis with a PCR test that uses a different target site and test of cure is also increasingly used to confirm clearance post-treatment.

Treatment & Management

The treatment of gonorrhoea in the UK is guided by antimicrobial sensitivities and the site of infection (Bignell and Fitzgerald 2011). *N. gonorrhoeae* can quickly develop resistance to antibiotics (Tapsall, Ndowa *et al.* 2009;Lewis 2010) and close monitoring of changing sensitivities is conducted in the UK and Europe to ensure appropriate use of antibiotics (Health Protection Agency 2010;European Centre for Disease Prevention and Control 2011). Currently, in the UK, single dose intramuscular antibiotics are used in combination with oral antibiotics to treat *N. gonorrhoeae* although there is an argument to use extended courses and alternative combination therapies in an attempt to limit further resistance developing (Bignell and Fitzgerald 2011). As with the management of *C. trachomatis* infection, contact tracing and partner notification are critical parts of *N. gonorrhoeae* management. In addition, given the concerns about antimicrobial

resistance, a test of cure following treatment is sometimes performed to ensure the organism has been effectively treated (Bignell and Fitzgerald 2011).

Mycoplasma genitalium

Background

Mycoplasma genitalium (*M. genitalium*) is a sexually transmitted bacterium of the mollicutes class which was first identified in the early 1980s after being isolated from the urethrae of two men with urethritis (Tully, Taylor-Robinson *et al.* 1981). It is a fastidious organism and extremely difficult to grow using culture techniques (Taylor-Robinson and Jensen 2011). For that reason, it has been a challenging organism to study until the advent of PCR techniques, a factor that has limited our understanding of the STI syndromes with which it is associated.

Epidemiology

The UK epidemiology of *M. genitalium* is not well described as, currently, it is not routinely tested for in clinical practice. Furthermore, to date, there have been no cross sectional studies performed of *M. genitalium* prevalence in the UK general population. Small studies in specific patient groups have been done but they are not generalisable (Horner, Gilroy *et al.* 1993;Keane, Thomas *et al.* 2000;Horner, Thomas *et al.* 2001;Leung, Eastick *et al.* 2006;Ross, Brown *et al.* 2009;Oakeshott, Aghaizu *et al.* 2010;Soni, Alexander *et al.* 2010). However, the third National Surveys of Sexual Attitudes and Lifestyles (Natsal) has undertaken *M. genitalium* testing among some participants which will add to our knowledge of prevalence within the general population of Great Britain once data is available.

Pathology

Whilst it well accepted that *M. genitalium* is associated with urethritis in men (Jensen 2004) there has been controversy about the importance of *M. genitalium* as a pathogen in women. However, there is growing evidence that *M. genitalium* infection is associated with adverse reproductive health and genital tract inflammation in women (Haggerty 2008). Therefore, whilst there is scant evidence to suggest that *M. genitalium* causes anything more than urethritis in men, untreated infection may have important health implications for their female sex partners similar to untreated Chlamydial infection. Furthermore, *M. genitalium* has been shown to be associated with an increased risk of HIV acquisition among women in Africa (Mavendzenge, Van Der Pol *et al.* 2012). It is feasible, given the high prevalence of rectal infection with *M. genitalium* seen in MSM in some studies that this may be an important driver of HIV infection among this population (Soni, Alexander *et al.* 2010).

A single study has looked at concordance rates of *M. genitalium* infection between sex partners (Anagrius, Lore *et al.* 2005). They found a higher rate of infection in female partners of men with *M. genitalium* (45%) than in male partner of women with *M. genitalium* (38%) suggesting that infection may be more efficiently transmitted from men to women than vice versa.

Diagnosis

Although *M. genitalium* has been shown to be sexually transmitted, a cause of both symptomatic and asymptomatic urethritis, and associated with significant reproductive sequelae in women, current international STI testing guidelines do not recommend testing GUM clinic attenders for the infection (British Association for Sexual Health and HIV 2006). This is in part due to the lack of routine testing platforms and the lack of good prevalence, public health and health economic studies of the impact of this infection. In the UK it is currently not possible to diagnose *M. genitalium* among men and women attending NHS GUM services unless they are part of specific research trials.

Treatment & Management

M. genitalium can be treated with oral antibiotics but there is significant variation in efficacy between different antimicrobials. However, it appears that current first line treatments for urethritis (single dose azithromycin or one week of doxycycline) may be poor choices for empirical treatment for *M. Genitalium* (Jensen 2009). Furthermore, among men with symptomatic urethritis who do not respond, i.e. remain symptomatic, after first line treatment, second line treatment remains poorly efficacious for *M. genitalium*. Given that the first line treatments are highly effective for *C. trachomatis*, it is hypothesised that persistent urethritis may be caused by *M. genitalium* and that current guidelines fail to adequately treat *M. genitalium*. It is currently thought that there is insufficient evidence to support routine partner notification for *M. genitalium* (British Association for Sexual Health and HIV 2007). The ideal treatment regimen for *M. genitalium* is

not known. Where infection can be confirmed, treatment with extended courses of azithromycin may be warranted if single dose azithromycin has not already been tried. Moxifloxacin seems to be highly efficacious although concerns have been raised over the risk of potential hepatotoxicity.

Male genital clinical syndromes: Urethritis

Background

Urethritis is inflammation of the urethra (Holmes, Sparling *et al.* 2008). This can be in the presence (symptomatic) or absence (asymptomatic) of symptoms. The most common symptoms are urethral irritation, urethral discharge and dysuria (Holmes, Sparling *et al.* 2008). Basic classification of urethritis divides it into gonococcal urethritis and non-gonococcal urethritis (NGU). Historically, this classification comes from a time when gonorrhoea was the only identifiable STI cause of urethritis. Therefore, at that time NGU contained a multitude of unidentified STI causes including *C. trachomatis*. Once *C. trachomatis* was isolated, it was possible to further sub-divide NGU into chlamydial urethritis and non-gonococcal, non-chlamydial urethritis (NCNGU).

Pathology

There are many infectious and non-infectious causes of urethritis. *C. trachomatis* and *N. gonorrhoeae* are the most common STI causes in men, however, not only may both of these infections be present without symptoms (with and without urethritis), they may also be present without causing any inflammation (Holmes, Sparling *et al.* 2008). This is less likely in the case of urethral gonorrhoea where

more than 90% of men are symptomatic (Bignell and Fitzgerald 2011), however, only half of men with urethral chlamydia will develop symptoms of urethritis (British Association for Sexual Health and HIV 2010). Non-infectious causes include urethral strictures, trauma to the urethra and foreign bodies within the urethra.

Both symptomatic and asymptomatic urethritis can occur in the absence of chlamydia and gonorrhoea (NCNGU). Several infectious pathogens have been associated with NCNGU including herpes simplex virus, Trichomonas vaginalis and ureaplasma species (Shahmanesh, Moi *et al.* 2009). Of increasing research and clinical interest is the role of *M. genitalium* in NCNGU.

Diagnosis of urethritis

Urethritis is diagnosed using light microscopy. A small metal or plastic loop is inserted into the urethra and used to collect a sample from the mucosal surface. This is smeared onto a glass slide and stained using Gram's method. This slide is then examined with a microscope. Although the exact diagnostic criteria have changed over the decades the underlying principle is to use the presence of polymorphonuclear leucocytes (PMNL) to demonstrate inflammation of the urethral mucosa (Shahmanesh, Moi *et al.* 2009). Current international diagnostic criteria require an average of five or more PMNL to be present over five high powered fields (HPF) (x1000) with the greatest concentration of PMNL in order for a diagnosis of urethritis to be made (Shahmanesh, Moi *et al.* 2009). If these criteria are met, but there is an absence of bacteria that are morphologically

typical of *Neissieria gonorrhoeae*, then a diagnosis of non-gonococcal urethritis or NGU is made (Shahmanesh, Moi *et al.* 2009).

There is considerable inter- and intra-observer variation in the diagnosis of urethritis using microscopy (Willcox, Adler *et al.* 1981). Some studies have looked for other methods to accurately detect urethral inflammation, including the use of urine dip leucocyte esterase tests and flow cytometry (Horner and Taylor-Robinson 2007). The clinical utility of these is not fully understood at this time.

In addition to the microscopic criteria described above, some diagnostic criteria require men to be symptomatic in order to receive a diagnosis of urethritis (British Association for Sexual Health and HIV 2007). Indeed, many sexual health services only look for urethritis in symptomatic men, which is in line with current guidance from the British Association for Sexual Health and HIV (BASHH) (British Association for Sexual Health and HIV 2006). If this guidance is followed, men with asymptomatic NCNGU will no longer be identified. The clinical consequences of this are unknown.

Treatment & Management of urethritis

Urethritis is treated with empirical antibiotic therapy. Most commonly this is with a single oral dose of Azithromycin (British Association for Sexual Health and HIV 2007;Shahmanesh, Moi *et al.* 2009). This has good efficacy against *C. trachomatis* and partial cover against *M. genitalium*. By giving empirical treatment it allows for a percentage of infections to be treated before confirmatory

test results are available, thus expediting appropriate management and disease control. However, where BASHH guidelines are followed, men with asymptomatic NCNGU are no longer being identified or receiving antibiotics.

It is assumed that asymptomatic men with urethritis secondary to *C. trachomatis* will be detected using standard tests for urethral *C. trachomatis*. The result of this test is not available for several days and, therefore, treatment can be delayed in these men. Men with asymptomatic urethritis who do not have *C. trachomatis* will be missed altogether under national guidelines. The consequences of undiagnosed and untreated asymptomatic NCNGU are not known, however, the current guidance implies it is of no significance as they no longer advocate its detection or treatment.

Testing for STIs

Until approximately a decade ago, invasive, internal, and often uncomfortable swabs were necessary to collect suitable samples for the identification of *C. trachomatis* and *N. gonorrhoeae* (Apoola, Herrero-Diaz *et al.* 2011). The process involved in the collection of these samples meant that patients were required to attend specialist services located in hospital settings. In addition to culture and enzyme-linked immunosorbant assay (ELISA) techniques for diagnosis, microscopy of debris collected on the swab were examined immediately by microscopy. This sometimes allowed for a presumptive diagnosis of Chlamydia or gonorrhoea to be made whilst the patient was still in the clinical setting and up to several weeks before confirmatory test results were available. Epidemiological

antibiotic therapy could be taken at that time and partner notification commenced to limit the duration of infection and chances of STI transmission and reinfection.

Role of microscopy

Microscopy has traditionally played a number of roles in the detection of STIs. Examination of collected specimens under the light microscope has allowed clinicians to make immediate presumptive diagnoses of infections and treat patients at their first visit to services. Furthermore, patients could be warned of the possibility of infection and advised to abstain from sex until adequately treated and to ask sexual partners to attend services for testing and treatment. These strategies (early presumptive treatment and partner notification) aid the control of STIs within populations.

More specifically, in men, microscopic examination of a gram stained urethral smear was performed. Examination of this slide can lead to one of three outcomes. Firstly the smear could show no organisms or inflammation. This is considered to be a normal urethral smear and any further treatment would wait until confirmatory laboratory tests had been performed on urine. If *C. trachomatis* or *N. gonorrhoeae* is detected on the urine then the man is recalled for appropriate treatment.

Secondly, Gram negative intracellular diplococci (GNIDC) may be seen on the urethral smear. This is suggestive of infection with gonorrhoea (gonococcal

urethritis). In this situation the man would be given appropriate empirical antibiotics to treat *N. gonorrhoeae*. Treatment for *C. trachomatis* is also given as these organisms may co-exist and there is a synergistic effect of azithromycin with antibiotics given specifically for *N. gonorrhoeae*.

The final possible outcome is when urethral inflammation is detected (≥5 PMNL/HPF) but in the absence of GNIDC. This is a diagnosis of non-gonococcal urethritis (NGU). As this can indicate infection with *C. trachomatis*, empirical treatment for *C. trachomatis* is given even before confirmatory test results are available. However, for men initially diagnosed with NGU, it is possible that *C. trachomatis* is not detected on confirmatory urine tests. In this case the diagnosis can be refined to one of non-chlamydial non-gonococcal urethritis (NCNGU). This means that urethritis was present in the absence of identified infection with either *C. trachomatis* or *N. gonorrhoeae*.

Recent changes in male STI screening:

Changes to the use of microscopy in clinical practice for diagnosis

Because invasive samples had to be taken in all patients for the diagnosis of *C. trachomatis* and *N. gonorrhoeae*, microscopy used to be performed in all men and women regardless of reported symptoms. However, with advances in molecular technology invasive samples were no longer necessary in order to diagnose Chlamydia or gonorrhoea. These new tests are so sensitive and specific that they became the preferred methods of testing in patients and, in asymptomatic men and women where examination was felt to be unnecessary, they quickly replaced all

other tests. Furthermore, samples (urine or vulvo-vaginal swabs) could both be self-collected by the patient obviating the need for clinicians to be present and, perhaps more importantly, for samples to be collected in clinical setting. This is especially important as urethral smears have a low acceptability among many men (Tilson, Sanchez *et al.* 2004) and can be extremely uncomfortable (Apoola, Herrero-Diaz *et al.* 2011). As intimate examination by a clinician is no longer necessary in order to collect these samples, testing for STIs can now be performed in settings without the presence of health care professionals or access to microscopy. This led to a paradigm shift in the way that STI testing services could be delivered and paved the way for the delivery of STI testing in any number of alternative settings.

Whilst this increases the options for testing, it is not possible to perform microscopy in outreach venues. Furthermore, current UK and international guidelines only recommend performing urethral smear microscopy in symptomatic men (British Association for Sexual Health and HIV 2006;Shahmanesh, Moi *et al.* 2009). This means that, when guidelines are followed, a diagnosis of asymptomatic urethritis can no longer be made. Whilst chlamydia and gonorrhoea can still be diagnosed in asymptomatic men by following the guidelines (all men regardless of symptoms are tested for these infections), they imply that the condition of asymptomatic non-chlamydial, non-gonococcal urethritis is of no clinical consequence as there is no way of making this diagnosis without performing urethral smear microscopy in asymptomatic men. Conversely, all men with symptoms of urethritis have a urethral smear and

would be given antibiotic therapy if urethritis was diagnosed, even in the absence of detectable infection with chlamydia or gonorrhoea (symptomatic NCNGU).

This sets up an assumed "hierarchy of importance" of different causes of urethritis. At the top of this hierarchy is symptomatic urethritis as all men with this condition will receive immediate treatment. Implicit in this assumption of importance is that a proportion of those cases will be chlamydia however, even men with symptomatic NCNGU will receive antibiotics as this will help symptoms in a proportion of cases. These men also undergo partner notification irrespective of whether an organism is detected. Therefore, it could be assumed that symptomatic *M. genitalium* is thought to be important.

Below this is asymptomatic *C. trachomatis* as these men have to wait for diagnosis and treatment. However, asymptomatic *M. genitalium* will never be detected as no specific tests will be performed and urethritis as a proxy marker of infection is not looked for. This distinction between the importance of symptomatic versus asymptomatic STI is not made for any other STI - chlamydia is important whether or not it causes symptoms. At the bottom of the hierarchy is asymptomatic NCNGU as these men do not undergo testing for urethritis nor will they receive any treatment.

As *M. genitalium* is partially sensitive to antibiotics commonly used to treat urethritis [see summary of *M. genitalium* treatment studies in appendix], prior to changes in testing guidelines, all men with urethritis (symptomatic or

asymptomatic) would have received treatment against *M. genitalium* as would their sex partners. Now this only applies to symptomatic men as asymptomatic urethritis is no longer detected. This clinical approach to asymptomatic NCNGU is not universally supported by sexual health experts (Maw and Robinson 2004;Horner 2007;O'Mahony 2009) and the public health and economic impacts of removing asymptomatic NGU and NCNGU as possible diagnoses are not known.

Policy context:

National Strategy for sexual health

1998: CMO report on C. trachomatis

In 1998 the Department of Health published findings from a report by the Chief Medical Officer's Expert Advisory Group on whether a national screening programme for *C. trachomatis* should be set up in England (Department of Health 1998). The report highlighted the significant burden of *C. trachomatis* infection on public health and considered a number of screening strategies. Importantly, it recommended screening only for symptomatic men who presented to relevant medical services. Opportunistic screening for asymptomatic individuals was to be concentrated on women under 25 because of three main reasons;

> *"The first is that the sequelae are more serious for women and asymptomatic cases have to be detected if the incidence of complications is to be reduced. The second is that they are more likely than men to*

attend a health care setting where screening is feasible. The third is that computer modelling has shown this to be cost-effective."

Surprisingly there was very little published in the UK academic journals in response to this report. Duncan and Hart pointed out the potential for unintended consequences of gender based screening for an infection that is present in both men and women (Duncan and Hart 1999a;Duncan and Hart 1999b). Among these was a further reduction in men's responsibility for sexual health, something which had a potential to disadvantage both men, by restricting their access to sexual healthcare, and women, by maintaining traditional patriarchy-based power dynamics.

2003: National Chlamydia Screening Programme

In 2003 a National Chlamydia Screening Programme (NCSP) was created in England to target sexually active men and women under 25 years with opportunistic screening in a range of venues. However, the NCSP has faced major challenges in achieving desired levels of coverage in both men and women (National Audit Office 2009) and, although the prevalence of Chlamydia in men and women is similar, rates of chlamydia screening in men is poor, accounting for only 30% of all tests in 2011 (National Chlamydia Screening Programme 2011).

The objectives of the National Chlamydia Screening Programme are to; "1) Prevent and control chlamydia through early detection and treatment of

asymptomatic infection; 2) Reduce onward transmission to sexual partners and 3) Prevent the consequences of untreated infection" (National Chlamydia Screening Programme 2012). However, despite a lack of gender specific objectives its annual rates of screening in men have consistently fallen below those in women (National Chlamydia Screening Programme 2011). Whilst the reasons for this are multiple, given the gender neutral objectives, it would appear that these differences are not because of intentional screening strategies. Indeed, the NCSP recognises that reaching men for screening is a particular challenge for them and they have commissioned research to look specifically at the issues (National Chlamydia Screening Programme 2009) and published guidance for regional NCSP co-ordinators on how best to engage men in screening (Forrest and Lloyd 2011). Despite this, screening rates in men remain lower than in women.

Changes to the NCSP

Following the NCSP review, and in response to the criticisms raised, the NCSP has made a number of strategic changes in an attempt to improve the programme. (National Audit Office 2009) The main focus of the changes has been to embed screening within primary care, moving away from the previous strategy of local screening offices coordinating a number of different screening events in numerous settings. Previously tests performed in general practice were requested using NCSP specific forms with NCSP screening offices undertaking the task of data recording, contacting and treating individuals with positive tests, and partner notification. This led to confusion among some General Practitioners as to how to request tests and manage infections among different groups. This led to infrequent

testing and a feeling of being distant from the whole process. (Personal Communication Estcourt C 2013)

Embedding screening within primary care removes the local screening offices from the process. (Department of Health 2012) GPs can now use their existing requesting software to order chlamydia tests. This helps to capture more complete recording of screening data and test results are fed straight back to requesting clinicians. In this way, GPs are once more central to the whole episode of care and maintain responsibility for clinical follow up throughout. Partner notification will primarily be the responsibility of the requesting clinicians with support offered from local sexual health services.

Incentivising people to test for Chlamydia, or healthcare professionals to offer testing, has also been removed from the programme as it does not appear to be beneficial to screening rates. It also reinforces the old strategy of total number of tests performed rather than the new one of diagnostic rate targets. Whilst total numbers of tests would have an effect on STI control if enough people were tested, the current NCSP uses opportunistic screening rather than a register-based approach. Therefore tests need to be targeted at those with the highest chance of infection based on the known epidemiology.

A number of attempts have been made by the NCSP to increase testing rates in men. The NCSP has commissioned qualitative research to explore men's attitudes to testing and to help produce guidance for screening offices. (National Chlamydia Screening Programme 2009;Forrest and Lloyd 2011) Whilst there has

been a rise in the number of tests performed in men over the years, they consistently represent around a third of all tests performed although most recent data shows a higher positivity rate in men tested compared to women. (Public Health England 2013)

2005: Choosing Health

In 2005 the UK Department of Health (DoH) published the White Paper Choosing Health (Department of Health 2005). This outlined six key priority areas for public health; tackling obesity; reducing numbers of smokers; tackling health inequalities; improving mental health; reducing alcohol related health issues; and improving sexual health. An extra £300 million was allocated by the then Secretary for Health, John Reid, to help modernise sexual health services. Strategic Health Authorities were responsible for performance managing services in their areas. One key performance indicator was 48 hour access to GUM for all patients in order to ensure timely detection and management of those with infectious STIs. Prior to these changes some people waited many days with symptomatic STIs before they were able to access treatment whilst continuing to be sexually active (Mercer, Sutcliffe *et al.* 2007).

Gender & Masculinities

This thesis focuses on the sexual health of men and therefore a discussion of what impact gender may have on sexual health is important. It is also important to consider how men themselves may contribute to the problem of lower testing rates among men in the NCSP. However, this assumes that there are fundamental

and measurable differences between men and women, something which has been debated among gender scholars for decades (Connell 1995). Whilst there are many theories for explaining gender, for the purpose of this discussion, and throughout the thesis, I use a "gender role theory". This is based upon a belief that gender is a social construction whereby individuals learn to perform a normative gender role that is expected by the society in which they are living (West and Zimmerman 1987). This allows for differences seen between genders to be explained with the help of the historical social context in which individuals find themselves; gender roles change depending on where and when men and women are socialised. This is in direct contrast to the use of a list of inherent characteristics that must be held in order to be of that gender, a philosophical viewpoint known as "essentialism" (Cartwright 1968). In this way, gender role theory would actually shift the focus of attention from men to society and gender performance expectations as the real crux of the problems in screening.

It is also necessary to introduce the concept of 'masculinities' in order to understand male gender role performance. This states that there are multiple ways to perform a male gender role, or multiple 'masculinities' (Connell 1995). Crucially, however, there is a 'hierarchy of masculinity' whereby all masculinities are compared to a single, perfect masculinity. This 'hegemonic' masculinity is used by society to subordinate other masculinities and affords its holders, the men who inhabit this hegemony, power over other men and women. However, the hegemonic masculinity is not necessarily the masculinity that is performed by the majority of men, nor is it necessarily a desirable set of masculine characteristics; it is the exalted masculinity. As such it can change over time and is dependent on,

among other things, the historical context. It is a useful concept to understand because men are judging their individual masculinity against this hegemony and, by the same standards, being judged by the society in which they are living. It may also help to explain certain observed male behaviours, not least those related to health seeking, and is often used as a way to explain poor health seeking behaviours in men.

One potential explanation for lower Chlamydia screening uptake in men than in women would be if there was a fundamental difference in how men and women approach healthcare. Whilst there is some empirical evidence to suggest that women are more likely to approach healthcare settings than men in general (Bertakis, Azari *et al.* 2000), it may be the case that men are less likely to seek healthcare until they are symptomatic or more severely affected by the problem (O'Brien, Hunt *et al.* 2005). Thus, men are attempting to perform gender in a way that is least damaging to their masculinity; to seek health may be seen as a feminine attribute whereas to 'solider on' in spite of discomfort is a more valued masculine behaviour. However, once symptoms impact on one's ability to perform a satisfactory masculine gender role, for example by not being able to work and thus provide for one's family, or having genital symptoms and not being able to perform sexually, a hierarchy of masculinity allows men to frame seeking healthcare as a way to maintain or regain more valued masculine attributes. Clearly, this may be difficult when infection with an STI is asymptomatic.

Masculine ideals may also exacerbate anxieties once a man presents to sexual health services, especially when a physical genital examination may be required. For heterosexual men being examined by male health care professionals (HCP), individuals may question their own or the HCP's sexual orientation (Shoveller, Knight *et al.* 2010). Conversely, frequently the only time that men are naked in front of women is likely to be when they are expected to perform sexually and this can give rise to anxieties about getting inappropriate erections when being examined by female HCPs (Shoveller, Knight *et al.* 2010). In both situations men may feel that their masculinity is being policed by HCPs through the process of taking a sexual history and physical examination of their sexual organs.

The System as the problem

Whilst the prevalence of Chlamydial infection is equally shared between men and women, it can be argued that women experience the greater burden of infection because of reproductive morbidity with a significant financial cost to the health service. Targeting women for screening on the basis of economic reasoning reinforces an association in the minds of individuals between STIs and women which may deflect the issue from being seen as relevant to men (discussed above).

The venues in which men and women are screened through the NCSP vary significantly. Some of the reasons for this seem simple to explain. For example, more women than men will be attending contraceptive, termination of pregnancy, antenatal and gynaecology services by the very nature of these services. This potentially means that there are greater opportunities to test women in health

settings than men. The acceptability to men of testing in non-healthcare settings is poorly investigated and just because this strategy is feasible it does not mean that it is the most appropriate. For example, enhanced services for Chlamydia screening through pharmacies may disadvantage men as these settings are seen as inherently female and awkward spaces for men to occupy (Men's Health Forum 2008). Conversely, offering testing for men in non-clinical settings may be an advantage for men who have employment commitments during traditional office hours and find it difficult to access health settings during those times, something which may be easier for women at greatest risk of STIs.

How do we engage men with sexual health?

Whilst the challenges to engaging men with STI testing are multiple and far reaching, there are important individual health, public health and social health reasons for increasing uptake of screening among men. The NCSP has been imaginative and pioneering in considering a range of non-traditional settings in which to screen men. However, regional NCSP offices were financially incentivised to achieve overall numbers of tests and not rewarded for detecting infections. Furthermore, the venues in which men wanted to access screening were unknown and many assumption about "what men want" have been made.

Which settings are appropriate?

Although the acceptability of testing venues is important, it is not the only factor to consider when deciding where to offer services. As discussed previously, effective STI control requires detection of infection and effective partner

notification. Uptake of testing is of course important to detect infections but so is the number of infections detected. The prevalence of infection within a population will determine how many infections are detected as a result of testing and will also have an important impact on the cost effectiveness of a programme. Testing large numbers of men in a low prevalence population is likely to be less cost effective than testing the same number of men from a high prevalence population. Therefore, those involved in the development and implementation of screening programmes much consider the population prevalence in the outreach setting when making decisions.

On the other hand, outreach may play an important role in reaching men and women who would not access testing in other settings. Therefore, even testing in low prevalence populations may pick up infections that would otherwise have gone undiagnosed and untreated. It may also increase visibility of sexual health services, raising the profile of services and prompt people to access sexual health care. Whilst the optimal locations, frequency of testing and target outreach populations are not known, it is imperative that there is robust evaluation of different outreach testing programmes to ensure value for money and the greatest public health impact.

Sporting venues for screening

There is some evidence to suggest that sport venues may be appealing to men as sites of STI screening (Kong, Hocking *et al.* 2009;Kong, Hocking *et al.* 2010) although they have not been extensively explored as venues for sexual health

interventions in the UK (see literature review for more details). In England, after swimming and cycling, more people play football (soccer) at least once a month for recreation than any other sport (Sport England 2011). Furthermore, more people are members of organised amateur football clubs than for any other sport (Sport England 2011). These facts make the use of amateur football settings a potentially feasible option for providing access to STI and HIV testing.

It is not know whether men who play football are less likely to use traditional health services to test for STIs or, even if they are less likely to take up screening than men in general. It is also unknown whether these men are at greater risk of acquiring STIs, an important consideration when setting up screening services as discussed above. One assumption may be that men who play traditional group sports are more likely to subscribed to traditional gender role performances with the associated impact on health seeking and risk behaviours.

Role of popular opinion leaders

Another strategy used in various sexual behaviour, STI and HIV screening studies has been the use of non-healthcare professionals to deliver public health messages (see Chapter 2, Literature Review). In particular, the use of sporting role models and other popular opinion leaders (POL) within clubs may offer potential for successful promotion of particular health behaviours. This approach may be more sustainable and deliver more powerful promotion due to the relationships between the POLs and the target population (Rogers 2003). Whilst the use of persons who are not medically trained to impart information about sexual health, testing and

treatment seems to be well accepted by targeted populations, the acceptability of combining these strategies (screening in sport settings and using opinion leaders to encourage screening) is poorly investigated.

Summary

Current models for the delivery of Chlamydia screening programmes may disadvantage men resulting in fewer men access testing than women. Since the National Strategy was published, commissioners of sexual health services in England, including the NCSP, have favoured provision of STI services in a wider range of settings supported by the advances in testing technologies and the non invasive sampling techniques required. Primary care trusts (PCTs) have attempted to increase sexual health provision in primary care, as well as offering screening and treatment in pharmacies, which may be less popular with men (Men's Health Forum 2008). Sexual health clinics increasingly combine contraceptive care with STI care, an approach providing a convenient “one-stop shop” for women, but which may be less attractive to young men.

These challenges are reflected in the NCSP testing data which shows that women are more likely than men to have been tested in what are termed “core services” (general practice, contraceptive and sexual health services and pharmacies). In contrast, men are more likely to have been tested in “non-core” or outreach settings (National Chlamydia Screening Programme 2011). It is generally accepted that efforts should be made to engage men with STI screening even if the cost-effectiveness of this as a public health strategy has been recently

questioned (Turner, Adams *et al.* 2011). In addition to the public health inequities of gender differences in STI screening there are important social implications of associating sexual health screening and STIs in general with women (Duncan and Hart 1999a;Duncan and Hart 1999b)

However, for effective chlamydia disease control it is not only necessary to screen large numbers of a population but to also have high rates of positive tests. Therefore, programmes which screen few men and have low positivity rates among those who are screened are unlikely to be effective in controlling the chlamydia epidemic (Kufeji, Slack *et al.* 2003). Outreach settings as venues for screening men may reach those who are unlikely to attend traditional settings but the positivity rates can be low (Johnson, Simms *et al.* 2010). Put into the context of the NCSP whereby men are more likely to be screened in non traditional settings where disease prevalence is low, it is reasonable to question the public health and economic benefit of current practices.

Whilst locating testing services in sport settings and using non medical professionals to encourage men to test have been used, their acceptability and public health impact has been poorly studied. Furthermore, the impacts of abandoning urethral smears and the inability to detect asymptomatic NCNGU in screening programmes is unknown.

The body of work in this thesis considers the acceptability of screening in different settings and the acceptability of engaging men with screening using a

variety of methods in football venues.

Chapter 2: LITERATURE REVIEW

Introduction

In this chapter I review relevant literature about (1) where men want to be tested for Chlamydia, (2) the acceptability of using non-traditional and sport settings for screening men, (3) involvement of popular opinion leaders in the promotion of sexual healthcare.

Deciding which literature to include in this review was challenging. Many areas of research are of relevance to this thesis: barriers and motivators to testing, acceptability of venues and services, feasibility of different venues, cost effectiveness work. However, it is unfeasible to review all the literature and therefore a pragmatic approach was applied to this review and I have focussed on literature that, in my opinion, best explains the current understanding of the core issues outlined in my background chapter. It is my aim to include enough of the diverse literature to give the reader a thorough understanding of what is already known without including material that is peripheral to the main themes.

Criticisms of the NCSP

In April 2003 the National Chlamydia Screening Programme (NCSP) was implemented in England as a direct result of the Chief Medical Officer's Expert Advisory Group's report on *Chlamydia trachomatis* (Department of Health 1998).

At that time, the group and report focussed its attention on women for screening for three main reasons;

> "The first is that the sequelae are more serious for women and asymptomatic cases have to be detected if the incidence of complications is to be reduced. The second is that they are more likely than men to attend a health care setting where screening is feasible. The third is that computer modelling has shown this to be cost-effective." (Department of Health 1998)

Although the report cites evidence from a number of trials to support this female-centric approach to screening, and screening in general, concerns remain about whether or not the evidence is robust enough to support any screening programme. Indeed, at a fundamental level, the definition of a chlamydia screening programme is not without debate (Low 2007). As Low clearly demonstrates in her critique of the NCSP evidence base, there are no randomised controlled trials (RCT) to support opportunistic or register based screening in England and commonly held dogma about the success of other programmes do not hold up to scrutiny (Low 2007). Her systematic review further highlights the lack of evidence in support of opportunistic chlamydia screening which is effectively what exists in England (Low, Bender *et al.* 2009). However, a few randomised trials of one-off screening events have been shown to reduce pelvic inflammatory disease in the UK and other countries after one year of follow up although the cost effectiveness was not reported (Scholes, Stergachis *et al.* 1996;Ostergaard, Andersen *et al.* 2000;Oakeshott, Kerry *et al.* 2010).

In the UK, the Chlamydia Screening Studies (ClaSS) were commissioned as a result of evidence gaps identified by the CMO Expert Advisory Group's report. Whilst the approach investigated (postal testing kits to 16 to 39 year-olds identified from GP registers) appeared to be feasible, participation rates were low (34.3%) (Low, McCarthy *et al.* 2004). Specific mention is made by the authors about the importance of including men in screening programmes because of the equivalent rates of infection and high proportion of those with asymptomatic infection. Roberts *et al.* used a modelling approach to examine the cost effectiveness of the English Chlamydia Screening Studies (ClaSS) and concluded that it would not be cost effective to use a register-based, home testing approach to chlamydia screening (Roberts, Robinson *et al.* 2007). Although the current NCSP is more opportunistic, the authors felt that costs would be broadly similar for an opportunistic screening programme, further questioning the economics of the current approach.

Opportunistic vesus register based screening

Two main methods of screening were considered for the NCSP. The first was a call-recall register-based system whereby everyone within the target population would be identified and offered a test periodically. Whilst this has the advantage of potentially reaching all relevant individuals, it was thought to be a relatively inefficient way to deliver Chlamydia screening for a number of reasons. Not everyone within the target age-range would be sexually active, therefore many individuals would be invited to screen who did not need to. Furthermore, those who did require screening would not necessarily attend for testing or return a

postal test kit if one was sent to them. These issues have a significant impact on the cost of a programme in terms of wasted resources.

The second screening method considered was an opportunistic system whereby sexually active individuals in the target groups would be offered a test as and when they attended a venue in which testing could take place. This avoided the pitfalls of a register based screening programme and was also backed up by an empirical study of opportunistic Chlamydia screening in Amsterdam, economic analysis and mathematical modeling. (Chapter 11)]. (1998;van den Hoek, Mulder-Folkerts *et al.* 1999) Therefore, an opportunistic model for screening was chosen for the NCSP.

The impact of poor coverage in men

The NCSP initially directed most of its effort on testing women rather than men. This was because the health consequences for women, notably infertility, were thought to be more serious and costly. It was believed that men most likely to have infections would then be picked up through partner notification for positive women. At a basic level this seems a valid strategy, however, there are a number of important negative consequences of this approach. By targeting women for screening, there is a fundamental assumption and link between women and sexual infections. It places the responsibility, and burden, of testing at women's feet and absolves men of any responsibility for their own, or their partner's, sexual well-being. From a feminist perspective, this surveillance of women's sexual health can be viewed as another example of patriarchy-based power and subordination of

women. It may also be possible, however, to frame it as empowering women's sexual health by ensuring access to testing whilst at the same time disadvantaging men by limiting theirs. These sociological perspectives of screening are often side-lined in favor of more 'tangible' public health outcomes but have a potentially important impact. Clearly there are also negative physical health implications of limiting men's access to testing associated with undiagnosed chlamydia infections.

The evidence base for the public health benefit of Chlamydia screening

The decision to create a chlamydia screening programme assumes at a fundamental level that there is a public health benefit to screening. This is not without debate and at the time of the NCSP's creation there was little empirical evidence to help support the decision process. Experience from Sweden suggested that screening led to a decline in prevalent infection over time following the introduction of a national screening initiative. (Herrmann, Johansson *et al.* 1991) A similar effect was seen in a screening programme based in a single state in the United States. (Addiss, Vaughn *et al.* 1993) This study also saw a reduction in the cases of pelvic inflammatory disease in women screened compared to a control group.

More recently, and since the introduction of the NCSP, more data has been published which may support screening (please see discussion on page 58, 59 and 62).

Whilst little evidence existed to support the benefit of creating a screening programme, similarly, none existed to suggest it might be harmful. However, as discussed above, screening may have important negative social implications.

Chlamydia screening in non-UK settings

Encouragingly, researchers in Australia and The Netherlands have taken this opportunity to plug this evidence gap by conducting randomised controlled trials (RCTs) before committing large amounts of public funds to a chlamydia screening programme (ACCEPT ;van den Broek, van Bergen *et al.* 2012). Despite similar estimated population prevalence of chlamydia in the Netherlands's study to those cited for the target groups in the ClaSS project (approx. 2.6% Netherlands *vs.* 2.8% UK), results did not support implementation of a register based screening programme. Participation rates were generally low with decreasing participation and non-significant drops in rates of those testing positive each round. Results from the Australian study are expected to be published in 2014 and, importantly, will include qualitative data about acceptability. Already rates of infection with chlamydia appear to be high, especially in rural settings, and slightly higher among men (4.7% of those tested in rural settings, 4.3% women *vs.* 4.8% men) (Hocking 2012).

Governmental review of the NCSP has been critical of suboptimal screening and partner notification rates and costly approaches to reaching targets (National Audit Office 2009). The 2009 National Audit Office report concluded that the NSCP had "*not demonstrated value for money*". It was particularly concerned

about the way in which local and regional screening programmes had been marketed and advertised with a significant "*duplication of effort and cost*". This report was picked up by the national press who were rightly concerned about how the £150 million assigned to the NCSP had been spent (Campbell 2009). The introduction of a Vital Sign Indicator for chlamydia testing in 2008-9 made testing a national priority and yielded rises in testing rates. However, treatment and PN remained at rates which were thought to be sub-optimal for effective disease control.

Increasing testing in men

At the time of writing, despite these difficulties, the NCSP remains in operation. Whilst there is continued debate about the best option in terms of increasing partner notification (PN) rates or testing more men (Turner, Adams *et al.* 2011), the NCSP, Department of Health and organisations such as Brook, have actively sought to increase understanding of how to encourage more men to test within current frameworks (National Chlamydia Screening Programme 2009;Forrest and Lloyd 2011). The widely held assumptions that men engage poorly with healthcare and that opportunities to screen men for chlamydia are lacking (Department of Health 1998;Bertakis, Azari *et al.* 2000) are not corroborated by all studies, although these explore general health care use among men and women and few within a UK health setting (Briscoe 1987;Macintyre, Hunt *et al.* 1996;Mustard, Kaufert *et al.* 1998;Fernandez, Schiaffino *et al.* 1999). Indeed, a significant proportion of young men do visit their GP on an annual basis, representing a potential setting to reach significant numbers of men (Salisbury,

Macleod *et al.* 2006). Despite this potential to test men in GP settings there are significant barriers to this approach. Although practice nurses are used to offering women chlamydia tests and examining women, in one study few had ever examined male genitalia or offered men a chlamydia test (Robertson and Williams 2005). GPs also identified several perceived barriers to discussing sex with patients in consultations, equating it to "opening a can of worms" (Gott, Galena *et al.* 2004).

Social implications of gender differences in testing

The stark contrast in how many NCSP tests are performed in men and women is difficult to explain on the basis of engagement with health services alone and likely represents a combination of factors including provider bias towards women for a number of cultural, social and policy reasons. The social implications of targeting women for screening is rarely heard in the ongoing debate, which focusses predominantly on financial outcomes. However, as some have argued, it is important to consider the wider impact of allowing screening programmes to put the responsibility for sexual health on women (Duncan and Hart 1999a;Duncan and Hart 1999b). A few studies highlight how social and cultural expectations may explain differences in how men and women approach sexual health. For example, once men are within sexual health services they are less likely than women to withhold information from their doctors (Bilney and D'Ardenne 2001). Although this shows a certain willingness to fully engage with their sexual healthcare, thereby challenging the "men are difficult to engage" myth, it may be that women withhold information due to social desirability about

women and sex. Men are also less likely than women to continue having sex once they recognise symptoms (Mercer, Sutcliffe *et al.* 2007). Again, imbalances in power may mean that it is more difficult for women to insist on no sex with male partners than it is for men. It may also be that the impact on men's ideas of self and masculinity mean that symptoms need to be dealt with quickly to restore sexual prowess.

Gender differences in testing

Understanding what men think about existing services and the reasons for their "non-engagement" is crucial if services are to be made more attractive to men or new services are to be created with men in mind. There is high acceptability of self taken urine tests for curable STIs, a common finding among many studies (Marrazzo and Scholes 2008) but implementing their use in non-clinical settings is not straight forward. Concerns about confidentiality (Ford, Viadro *et al.* 2004;Lindberg, Lewis-Spruill *et al.* 2006;Chaudhary, Heffernan *et al.* 2008), correct use of the test kit (Smith, Larro *et al.* 1999-2000;Ford, Viadro *et al.* 2004), handling urine (Stephenson, Carder *et al.* 2000) and negative emotions attached to an STI diagnosis (Ford, Jaccard *et al.* 2004;Lindberg, Lewis-Spruill *et al.* 2006) all impact on the willingness of men to test. Poor knowledge of how tests are performed perpetuates fear of painful and invasive testing methods (Wilkins 2005;Bradbeer, Soni *et al.* 2006;Shoveller, Knight *et al.* 2010).

There are also complex gendered assumptions held by men about sexual health provision. Pearson used focus groups with young men in different UK towns to

explore what men thought of existing sexual health services (Pearson 2003). Men reported that many sexual health services were seen as more appropriate for women because they offered female specific services (pregnancy tests, contraception), women were at greater need of services because they are the ones who get pregnant, and women were more likely to take precautions when it came to sex. Therefore, men were only likely to seek help when they wanted condoms or if there was urgent need for medical intervention (symptoms). Conversely, some women view sexual health clinics as places "…where filthy men go…", clearly equating services as catering primarily for promiscuous and dirty men (Scoular, Duncan *et al.* 2001).

Research of these barriers, however, is more frequently found for women than men. The reasons for this are probably explained by the initial focus of the NCSP on screening only women. Clear medical consequences of Chlamydia infection in women drove health economics and public health modelling work on the impact of a national screening programme (Turner, Adams *et al.* 2006;Gift, Gaydos *et al.* 2008). Furthermore, work done in the UK, Sweden and the United States showed that Chlamydia screening was associated with a decline in the prevalence of Chlamydia and PID (Scholes, Stergachis *et al.* 1996;Centers for Disease Control 1997).

The focus on women as the target for Chlamydia screening led to a situation where "…men have effectively been silenced on these issues…if both responsibility and accountability are defined as exclusively female, men have

neither the social means nor the personal motivation to take a more active interest"(Duncan and Hart 1999b). This leads to a situation where men are inherently disadvantaged by the screening system because of more limited opportunities to engage with screening and in turn leads to a reinforcement of pejorative sexual attitudes based on gender norms. The knock on effect to limiting an evidence base of acceptability of screening in men has disadvantaged both genders: by denying men access to services specifically designed for them and by placing the responsibility for sexual and reproductive health in the hands of women. This is echoed by Pearson's study (Pearson 2003).

These gender divides carry over into men and women's reactions to a positive chlamydia result (Mills, Daker-White *et al.* 2006). Participants of The Chlamydia Screening Studies (ClaSS) were purposively sampled and underwent in-depth interviews about their experiences. The sample frame was created to include men and women who had tested positive or negative for Chlamydia. Four main themes were identified with some important gender differences. Firstly, discomfort was experienced by both men and women at the thought of testing for chlamydia although women were especially concerned about the association between testing for sexual infections and the stigma attached to STIs and assumptions of promiscuity surrounding them. The second main theme was anxiety relating to each step of the testing process (having an infection and not knowing about it; the accuracy of the test; receiving a result; dealing with a positive result). Stigma was the third theme identified and was experienced significantly differently by men and women. Whilst women reported a lot of felt stigma (fear of being stigmatised) after receiving a positive test result, some men were positively boastful about

finding out they were infected with Chlamydia and *"…told loads of people…"* and *"…went down to town to celebrate…"*. This is a stark example of how men and women may experience the screening process and a positive result differently and underlines the importance of research in men to develop gender appropriate services. The final theme related to balancing the harms and benefits of screening. No participants regretted taking the opportunity to screen and many with positive results were relieved to have found and treated an infection sooner rather than later.

Darroch *et al.* also found gender differences in the experience of a positive chlamydia diagnosis (Darroch, Myers *et al.* 2003). Whereas women with a positive chlamydia test feared being blamed by partners and felt guilt at the possibility of transmitting the infection, men expressed the opposite opinion; they were likely to blame partners for potentially transmitting the infection to them and seldom felt any self-blame. It is not clear from the article whether the authors probed these responses further to try and unravel the reasons behind the differing views. However, the social and gendered approach to STI screening may help to create these views among men and women; women as the carriers of disease and men as the victims. It is important to note, however, that men also feel shame, embarrassment, disgust and disappointment when considering the impact of a positive chlamydia diagnosis (National Chlamydia Screening Programme 2009).

Stigma in testing

Stigma may be enacted or felt (Scambler and Hopkins 1986). Enacted stigma is actual discrimination by others on the basis of the illness whereas felt stigma is the feeling of shame associated with having an illness or the fear of experiencing enacted stigma. The felt stigma associated with attending a sexual health clinic may lead commissioners and clinicians to conclude that non-specialist settings are well placed to increase access to screening. However, in women at least, there is concern that screening in non-traditional settings may also be accompanied by a greater visibility of screening thereby turning a "discreditable" setting into a "discredited" one (Balfe, Brugha *et al.* 2010). This work uses Goffman's framework of stigma (Goffman 1959;Goffman 1963) to place screening in "front-stage" and "back-stage" settings. In order to avoid being discredited, most stigmatising behaviours would be played out back-stage, away from an audience. A traditional specialist setting would fulfil this requirement whereas non-traditional settings may be in danger of forcing an individual to perform potentially stigmatising behaviours in plain sight. In this way, pharmacies and gyms for example, could become "*…a site of performance risk by inserting back-stage maintenance practices into front-stage areas."* (Balfe, Brugha *et al.* 2010).

There is a tension between these ideas of wanting to keep the screening process as private as possible and wanting to test in settings that are not associated with being stigmatised. The barrier of being observed to undergo a screening test can potentially be overcome if all members of a group undergo screening; "blanket testing" (National Chlamydia Screening Programme 2009). However, some settings such as night clubs and football matches are seen as "incongruent with mindset" and rejected as suitable screening venues. Clearly, the balance between

these factors of felt stigma, observed performance and gender impact greatly on the potential success of any screening strategy. Ultimately this balancing act seems to be about limiting the damage to one's image and masculinity, a so called 'hierarchy of threats' to masculinity (O'Brien, Hunt *et al.* 2005).

Where do men want services to be located?

Few studies have been broad enough in scope to ask where men want screening services to be located. Instead, many ask about attitudes towards specific venues and rarely focus solely on men. Surprisingly, many of these studies were conducted several years after the NCSP was first implemented and not always in England. Brugha *et al*., a research group in the Republic of Ireland, asked young Irish men and women about where they would like services to be located (Brugha, Balfe *et al.* 2011). The idea of being offered a chlamydia test kit was highly acceptable to all participants but significantly more so for men (96.2% males *vs.* 92.9% females; $p<0.001$). Men also reported being offered a test by a non-healthcare professional more acceptable than women although rates were still low (4.6% *vs.* 2.2%; $p<0.001$). Significantly fewer men preferred to be offered a test by a nurse than women (53.7% *vs.* 81.5%; $p<0.001$). For men, General Practice was the preferred location of screening services (64.1% and 70%, respectively), with student health (59.6%) and GUM clinics (46.5%) coming second and third highest. By contrast, women preferred student health clinics (70.2%) over general practice (70%) with GUM clinics coming third (58%). Participants were not asked about preference for non-clinical settings for being offered tests.

Use of non-healthcare settings in testing

School settings have been used in a number of studies to reach young men and women for chlamydia testing (Burstein, Waterfield *et al.* 1998;Cohen, Nsuami *et al.* 1998;Cohen, Nsuami *et al.* 1999;Nsuami and Cohen 2000;Wiesenfeld, Lowry *et al.* 2001). Participation rates in screening have been high in these studies with between two-thirds and 95% of students undergoing testing. Chlamydia positivity was also high, with as many as 21% of women and 6% of male students testing positive (Burstein, Waterfield *et al.* 1998;Cohen, Nsuami *et al.* 1999). Furthermore, participation in repeat testing and successful administration were also high with 88% of students testing annually for three years in one study (Nsuami and Cohen 2000) and 88% of positives receiving treatment in another (Cohen, Nsuami *et al.* 1998). Although the studies mentioned here took place within the USA and many used existing school-based clinics and nursing staff to coordinate testing, the results are encouraging and may be applicable to UK settings.

A variety of community settings (bars, youth detention centres, community based organisations, pharmacies, sports clubs, work venues) have been used to offer testing to young men and women with a wide degree of success in terms of testing rates (Gunn, Podschun *et al.* 1998;Oh, Smith *et al.* 1998;Hamel, Judson *et al.* 2001;Debattista, Clementson *et al.* 2002;Kong, Hocking *et al.* 2009;Lorimer, Reid *et al.* 2009;Currie, Deeks *et al.* 2012). It is universally difficult to report accurate response and uptake rates from these venues and some researchers have used time taken to receive a sample as a way to measure success. Participation rates, when

reported, vary widely and success was highest in venues where men were "captive" with 98.5% participation among those approached in detention centres (Oh, Smith *et al.* 1998), but as low as 40% of those approached in a Gay bar in Brisbane (Debattista, Clementson *et al.* 2002), and 14% of male teens approached in parks, athletic fields, recreation centres, shopping malls and street corners by male peers in another study (Gunn, Podschun *et al.* 1998). Positivity rates vary widely (8.8% Oh et al, 6.1% Gunn et al, 4.3% Debttista et al). A number of studies have tried to incentivise testing using money and vouchers (Rietmeijer, Yamaguchi *et al.* 1997;Debattista, Clementson *et al.* 2002;Currie, Deeks *et al.* 2013) however, robust economic analysis of these approaches has not been published making it difficult to assess the cost effectiveness of this approach.

Work settings have been used in several studies, one of which specifically aimed to increase chlamydia testing in men (Wilkins 2005). There were two stages to this study. Firstly, focus groups were held with men aged between 18 and 25 to try and identify common misconceptions about chlamydia, thoughts on testing and ways to encourage uptake of tests. The second stage of the research used these findings to try and tailor a poster and leaflet promotion campaign to encourage chlamydia testing among more than 4,000 male workers at six industrial work places in England. Urine testing kits were left in displays in toilets at the workplaces. 2892 testing kits were taken. However, only 401 (14%) of these were returned to the laboratory for testing. Of these 401 tests, 15% were from women. The overall prevalence of chlamydia among the returned tests was 2.5% with a further five cases found through contact tracing. The researchers

performed some basic cost analysis and estimate that the cost for each of the 10 cases of chlamydia found was £695.

Lorimer [2009] also used the work setting as a venue for testing in a study of three non-medical settings (Lorimer, Reid *et al.* 2009). Men and women aged between 16 and 24 were approached in the canteen of a further education college, the main foyers of three local authority leisure centres and the kitchen of two call centres. Participants were asked to complete a confidential questionnaire and offered a urine chlamydia test. The overall participation rate among the 431 people approached was high in all settings at around 85%. However, the uptake of screening was lower at 32%. This varied significantly by setting with the highest uptake in leisure centres (48%) and only 19% and 27% in education and workplace settings, respectively ($p<0.001$). Significantly more men than women provided urine samples (40.1% *vs.* 26.8%; $p<0.001$). More women had previously tested for chlamydia, 33.5% *vs*. 13.2%. The prevalence of chlamydia in the sample was 4.4%. Although the authors acknowledge that the time taken to recruit the participants would prohibit this strategy as a long term option for screening, they draw attention to the higher uptake in men and acceptability of this approach. Her study showed that male gender, health & fitness settings and perception of risk of Chlamydia were strong predictors of uptake of testing.

In an attempt to reach more men in outreach settings, sporting, health and fitness venues have been used in a small number of studies and testing programmes (Kong, Hocking *et al.* 2009;Lorimer, Reid *et al.* 2009). Little data is published but

these testing initiatives (screening men who are members of sport clubs) seem to be acceptable and yield high participation rates among men invited to take part. In Kong et al's study of testing in Australian Football League (AFL) clubs, uptake of screening was over 95% of those eligible on the recruitment night (n=709). 77% were sexually active. The prevalence of chlamydia was 3.9% (95% CI 2.6-5.7); highest among women (4.5%; 95% CI 2.6-10.3 versus 3.5% in men; 95% CI 2.1-5.4). Twenty participants were randomly selected to undertake a post-testing questionnaire of whom 12 agreed to take part (seven men, five women). 80% found the testing strategy useful in increasing access to screening and health promotion. Almost all, 92%, would be happy to test yearly using this method. No cost effectiveness data is presented nor are there any in depth qualitative findings published. Authors conclude that this screening strategy may be an effective and acceptable way to increase testing among those who, because of geographical location, may find it difficult to access traditional settings. However, overall recruitment rates were fairly low (only 24% of all clubs approached) and the time cost for health care professionals was large, perhaps limiting the long term feasibility of this approach. As the authors suggest, embedding these testing opportunities within existing community organisations such as sports clubs may ensure that programmes are sustainable and less costly. However, the rural settings of Kong et al's study means that findings may not be generalisable to men who live in larger urban centres with greater access to traditional testing options. Despite this lack of trial evidence several programmes aimed at men's health in general have been set up in UK sports stadia (Witty and White 2010;White, Zwolinsky *et al.* 2012) although no formal study of chlamydia testing in UK sport settings has been conducted to date.

Theories to explain use of opinion leaders

Popular opinion leader theory

The ideas behind moving testing out of traditional settings can be taken further still by moving health promotion out of the hands of public health workers and using peers and opinion leaders instead. A peer is ‘a person of the same standing or rank as the person(s) in question; a person or thing of the same effectiveness or ability as the one(s) in question; an equal’ (Peer.) although this definition is rarely strictly adhered to in studies (Saunders 2010). A popular opinion leader is a more complex concept to define but involves ‘the degree to which an individual is able to influence other individuals’ attitudes or overt behaviour informally in a desired way with relative frequency’ (Rogers 2003). Whilst several theories potentially help to explain the use of popular opinion leaders to encourage men to screen for STIs and HIV (Turner and Shepherd 1999), no one theory explains all the processes involved and often no underlying theory is stated in published studies of peer led and popular opinion leader-led interventions.

Most frequently it is Roger’s Diffusion of Innovations (DoI) theory which is used in POL research (Rogers 2003). This theory suggests that diffusion is the “process by which an innovation is communicated through certain channels over time among members of a social system”. An innovation is any idea or technology that is new to the intended population. Ryan & Gross first studied this phenomenon in American Farmers when studying the way in which farmers took up, or adopted, the use of disease resistant grain (Ryan and Gross 1943). Rogers later described an S-shaped curve of adoption, whereby, relatively few people adopt the

innovation to begin with, so called early-adopters or innovators, followed by ever increasing numbers of people until only a few "late adopters" and "laggards" remain. Although several factors impact on the uptake of an innovation, at the core of the theory is the use of communication channels between members of a network and, crucially, using the person at the centre of these networks (the opinion leader). These people can be responsible for helping to persuade others to adopt certain behaviours

Whilst DoI theory seems well placed to explain the phenomena of health promotion within communities, it is easier to explain the uptake of physical interventions and behaviours (condom use or STI testing for example) than it is to explain the cessation of behaviours (smoking, drug use, multiple sex partners) which are difficult to conceptualise as innovations. Personal decisions about health and changes in social norms may explain these behaviour changes better and other theories may be needed. However, DoI theory does well to consider both sides of the behaviour change process; factors associated with the individual and those associated with the innovation. This is lacking in other theories which are briefly outlined below.

Stages of Change, Prochaska

Prochaska's Stages of Change (SOC) theory is a much more individual-focussed theory to explain how behaviours change over time (Prochaska and DiClemente 1983). Some features are very similar to DoI in so much as there are several distinct phases of the decision process through-which an individual must move

back and forth before committing to change. However, no explicit mention is made about how features of an innovation, communication or social norms impact on this process. In fact, SOC specifically talks about behaviours rather than physical innovations or technologies. Whilst using DoI theory it is difficult to explain the diffusion of stopping an innovation, SOC is a much more intuitive model for stopping risky behaviours (smoking for example).

Precontemplation is the first stage in this model and represents a stage where the individual has no intention of changing their behaviour and may not be aware that a behaviour is causing them problems of needs to be changed. In this way it is similar to the knowledge stage of DoI where individuals need to gain knowledge of an innovation in order to consider its adoption.

Individuals move into a *contemplation* stage once they have a serious intention of changing their behaviour. Comparing this to a distinct stage of DoI theory is difficult and may be best thought of as a mixture of stages in DoI. It may also be that SOC and DoI explain the process of decision making in a slightly different order. Contemplation means that an individual acknowledges that they want to change a behaviour whereas DoI does not require this up until a decision needs to be made to adopt or reject an innovation, considered the last stage. Clearly individuals may move through stages at different speeds and someone who has no intention of adopting a certain behaviour change might move through the five stages in DoI or SOC very quickly. It is also possible to move backwards through the stages. This is accounted for by the constant surveillance or the maintainance/

rejection dichotomy in DoI whereas in SOC an individual can move back and forth between the distinct stages.

Preparation is the stage when individuals may have made initial steps towards changing a behaviour but have not successfully or fully adopted the change yet. Following preparation is the *action* stage where individuals proactively change behaviours and could be though of as the adoption stage in DoI.

Maintenance is a stage where people continue to actively modify behaviours and actions to continue the desired change. Once there is no risk of relapse and an individual is confident of continuation of a behaviour the final stage or *termination* is reached.

Popular opinion leader studies in sexual health

Many of these studies using peer led approaches have focused on modifying individual's risk behaviours among high risk populations; Men who have sex with men (MSM), commercial sex workers (CSW), injecting drug users (IDU), although a few studies do look at general populations. The largest of these studies to date is the National Institute of Mental Health (NIMH) international, multisite trial investigating the effect of using community popular opinion leaders (cPOL) on risk behaviour and sexually transmitted infection rates (2010). This study is unusual among POL studies as it uses biological testing for STIs and HIV as well as behavioural data to assess risk behaviours to measure the effect of the

intervention over a period of 2 years. This study ran in five countries (China, Russia, India, Zimbabwe and Peru) with between 20 and 40 sites in each country. Epidemiological and ethnographic studies were conducted before the main study in order to identify communities at risk of HIV and STIs and study sites that acted as social congregation points for communities. Sites had to represent relatively stable, non-migratory communities as the cPOL intervention relies on communication networks and changes in social norms. Care was taken to ensure that study sites were separated from each other geographically or by a physical barrier (rivers/ main roads) in order to contain any contamination between sites. Examples of study sites are trade school dormitories (Russia), wine shops (India), Vendor markets (China) and growth point neighbourhoods (Zimbabwe). There were between 40 and 188 participants at each of the sites (total n= 18,147).

Sites were paired and randomised to received cPOL delivered AIDS education together with standard education activities (intervention) or AIDS education alone (comparator). Study visits were conducted at baseline, 12 and 24 months and included risk behaviour interviews, STI and HIV testing and treatment, risk reduction counselling and distribution of free condoms. POLs were identified from ethnographic observations, nominations from key informants and population members and self nomination. In the intervention arm cPOLs attended between four and five small group training sessions on basic STI and HIV knowledge and how to deliver this information to others (role play). These messages were to be delivered during everyday conversations and interactions with community members which happened in addition to the other interventions received at study

visits. The study was powered to detect a 33% drop in STI incidence and 10% difference in reported behaviours.

Disappointingly, no significant difference was seen in reported unprotected sexual intercourse (UPSI) from baseline to 24 months between the intervention and comparator groups ($p=0.71$) although there was borderline significance in India alone ($p=0.053$). No significant difference was seen in rates of STIs and HIV between groups either ($p=0.29$). However, there was a potentially clinically significant reduction in rates of UPSI and STIs in both intervention and comparator groups over the study period of around 30% and 20%, respectively. Just over 60% of participants in the intervention arm reported having a conversation with a cPOL about condom use over the 24 month period.

On the face of it these results suggest that cPOL delivered interventions are not effective at reducing risks among community members. However, there are several key factors that may help to explain the lack of a statistically significant effect. Firstly, all participants, whether or not they were in the intervention group, received significant STI and HIV harm reduction counselling and literature even before any cPOL interactions. The effect of this can be seen by the reduction in STI rates and reported UPSI in the comparator group over the 24 month study period. Ethically it is not possible to run a comparator group without offering any access to condoms, testing or treatment. Along with the HIV testing often comes lengthy counselling about risk behaviour and strategies to reduce these. Clearly, even the non-intervention arms were receiving an intervention of sorts. Secondly, only 63% of community members in the intervention arm reported having spoken

to cPOLs about condoms. Given that the underlying theory for the intervention is diffusion of innovations with a view to changing social norms within the community, it may be that exposing only 60% of that group directly to a cPOL message is insufficient to effect change. Whilst it is commonly asserted that around 15-20% of the community needs to be trained as cPOLs in order to have an effect (Kelly 2004), there is limited data on how much exposure to the intended intervention is required in order to have a significant effect.

Concern was raised that some participants may have been exposed to other interventions or national campaigns during the study which led to risk reductions in those communities. For example, in India the Avahan study was also being conducted at that time and it is estimated that nearly all women in the comparator groups would have been exposed to the messages from that study (Thilakavathi, Boopathi *et al.* 2011). The Avahan study is another peer-led HIV prevention study targeted specifically at female sex workers which showed significant reductions in UPSI and syphilis infections and a stabilisation of HIV incidence over a four year period. As the NIMH study only ran for two years it may be too short a time to see a significant impact from the intervention. Clearly studies are limited in how long they can follow up participants and the longer the studies run for the more chance there is of other, extraneous factors having an effect on behaviour rather than the intended intervention. This balance between how long a study can run for and allowing enough time to see a meaningful impact from an intervention is difficult to strike.

Finally, although this intervention was targeted towards high risk communities, many of the participants were at fairly low risk of acquiring a new STI over the two year follow up period. This was either because they already used condoms or had very limited rates of partner change. So despite the settings being generally "high risk", there was considerable heterogeneity within the groups. In an attempt to capture this, the authors analysed data from China but only among the highest risk participants (Rotheram-Borus, Wu *et al.* 2011). They hypothesised that those in the intervention arm with an STI and reporting the highest behavioural risks at baseline would be less likely to have an STI and would report lower risks at 24 months than those in the comparator arm. What they found was that those without an STI at baseline were extremely unlikely to have one at the end of the study (less that 5% in either group) and that this low rate of STIs may explain the lack of effect seen from the cPOL intervention in the entire study. There was a significant reduction in rates of incident STIs (29.5% control arm vs. 16.5% intervention arm). The authors conclude that "Those with most risk have the greatest opportunity for improvement." They also suggest that a more accurate measure of the effect of cPOL interventions may be social attitudes and stigma among communities as these are precursors to changes within the entire community.

Popular opinion leaders and HIV prevention

Several studies have used POLs in an attempt to reduce HIV risk behaviours among gay men (Kelly, St Lawrence *et al.* 1991;Kegeles, Hays *et al.* 1996;Kelly, Murphy *et al.* 1997;Ziersch, Gaffney *et al.* 2000;Flowers, Hart *et al.* 2002;Miller

2003). In particular, using POLs to deliver HIV risk reduction messages in gay bars has received attention from various researchers due to its apparent efficacy (Kelly, St Lawrence *et al.* 1991;Kegeles, Hays *et al.* 1996;Kelly, Murphy *et al.* 1997). However, the success of this strategy has not been replicated in all settings (Flowers, Hart *et al.* 2002;Miller 2003).

Kelly *et al*. have used this model on a number of occasions. In 1991 they published results from their study using POLs to deliver HIV prevention messages in gay bars in two cities in Mississippi (Biloxi and Hattiesburg). Both of these cities have a population of between 50-75,000 and are situated around 60 miles from each other. There is reported to be little migration between the gays scenes of each city and high rates of risk behaviours among patrons of the gay bars there. Bar tenders were asked to observe the patrons and note down the names of those who seemed to be greeted most positively by others and have the greatest number of social interactions in the bar. If a name appeared on more than one bar tender's list then that person was approached to be a POL. 43 POLs were recruited (39 men, 4 women; mean age 30; 91% white). Baseline information was collected about the clientele in the bar using a questionnaire collected over three consecutive nights. The information collected included basic knowledge about HIV and AIDS, personal sexual risk behaviour and a measure of perceived social norms within the community. Study cities were comparable in terms of risk at baseline. These surveys were repeated after three and six month. Biloxi served as the intervention city and POLs attended four weekly 90 minute training sessions. These covered training about HIV epidemiology, risk behaviours and strategies to change risk behaviours. Ongoing support was offered to the POLs and the

researchers reviewed real life interactions with POLs during the study. 35 POLs attended all 4 training sessions.

A total of 371 peer conversations were recorded by the POLs although the researchers suggest that this is an underestimation of the actual number that took place. Baseline data were collected on a total of 659 men across the two cities and 603 men at follow-up. There was a 30% reduction in the reported rate of unprotected anal intercourse (UPAI) in the intervention city, with a lesser reduction also seen in the comparator city although p values are not reported. A reduction in the total numbers or reported sex partners was observed in the intervention city only, with a moderate rise in the comparator arm. Overall, a change was not seen in the responses to the social norm questions. Men who reported no UPSI were more likely to report having an interaction with the POL about HIV risk than those who had engaged in UPSI. This study paved the way for a larger, randomised controlled trial investigating the same intervention (Kelly, Murphy *et al.* 1997).

Eight cities were matched and randomised to the intervention (POL delivered HIV risk reduction health promotion in gay bars) or to act as controls. Cities were at least 50 miles apart with a population less than 180,000 people. Each city had between one and three gay bars. POLs were identified in the same way as before and attended weekly two hour training for five weeks. Control bars displayed HIV education materials.

1126 men completed the baseline survey and a further 1010 men after one year. In the intervention bars there was a significant reduction in mean numbers of episodes of UPAI reported over the last two months, almost 4 times less than in control cities. Participants in intervention bars also had an increase in the rate of condom use in the last two months (44.7% to 66.8%) and a declining trend in the percentage of men who reported any UPAI to approximately half the percentage reported in control cities. There was no significant change seen in the total numbers of sex partners.

Following the apparent successes of these two studies, a similar model of health promotion was investigated in Scotland (Flowers, Hart *et al.* 2002). This study used 42 peer educators to discuss gay specific sexual health messages in gay bars and to manage a free-phone hotline for gay men. Outcome measures included a mixture of self reported sexual behaviour and reported uptake of Hepatitis B vaccination among gay men attending 10 gay bars in Glasgow and Edinburgh. No significant differences were found in any outcome measure following the intervention. The authors offer several thoughts on why this intervention didn't work. Firstly they used peer workers rather than POLs. Clearly the motivations to deliver health promotion differ between peers and POLs, as do the willingness of recipients to accept the information given to them. The power of POLs lies in their key position within communication networks and groups. Peers do not necessarily occupy the same privileged position within social groups. Secondly, the training undertaken by the peer educators was not equivalent to that undertaken by the POLs in studies by Kelly et al. The key features of training packages to ensure effective interventions are unclear. However, raising issues

relating to sexual risk and negotiating condom use have been identified as being particularly difficult for educators. In this study, peer educators felt more confident delivering factual information rather than relationship advice. Thirdly, the population size was much greater in the Scottish study (n=2276 at baseline and 2498 at follow up after three years) leading the authors to consider whether these interventions are more likely to work in smaller, better defined population subgroups. Furthermore, the changes in the social norms of this population may have been greater than in previous studies, in part due to the longer follow up time, but also due to the introduction of HAART during the study in 1996. Treatment optimism and changing attitudes to HIV could lead to less condom use, counteracting any underlying intervention effect.

Selecting the right opinion leader

The importance of chosen POLs belonging to the groups to which they are delivering health promotion is highlighted in several studies. Miller et al. used the Kelly method of bar-tender identified POLs to recruit male sex workers in three "hustler" bars in New York City to deliver sex and drug use risk reduction education to other CSWs and patrons (Miller 2003). POLs attended three training sessions covering knowledge, communication skills and role plays. Data was collected at baseline, two, four, six and eight months. No control bars were used. Overall there was a 12% decrease in the number of men reporting paid, UPOI ($p<0.01$); a 33% decline in reported paid, UPAI ($p<0.05$); and no change in unpaid UPSI. No changes were seen in reported social norms but effects were greatest in bars with more stable populations showing a possible importance of

more cohesive social networks. Interestingly and importantly, latino and white men benefitted from the intervention but no effect was seen in black men. This perhaps underlines the crucial nature of POLs belonging to the social group in which they are attempting to change behaviour but also the complex nature of social subgroups and complex relationship between sexual orientation, gender and race.

The importance of POLs being embedded/ part of the social groups in which they are working is highlighted in another study by Broadhead et al who recruited injecting drug users as peers to deliver drug use risk reduction education to active drug users (peer delivered intervention: PDI) (Broadhead, Heckathorn *et al.* 1998). The effect of this was compared to traditional outreach worker interventions (TOI). The authors questioned the potential "stagnation" and "underperformance" of TOI. The interventions were compared across two cities in Connecticut, USA, which were separated geographically to avoid contamination. Workers were responsible for finding, speaking to and encouraging IDUs to attend charity premises to access health promotion, risk reduction activities and clean works, bleach and needles.

PDI recruited 36% more IDUs into the project who were from a larger geographical area than those recruited by TOI. Given the challenges involved for IDUs to travel to the project, a greater number traveling from further afield represents a significant achievement. Risk reduction knowledge was significantly greater among the IDUs recruited by the PDIs than the TOIs. Significantly more

IDUs in the TDI arm reduced needle sharing compared to the TOI arm (-48% vs. −22%; p=0.007); reduced syringe and cooker sharing (-76% vs −11%; p=0.009). The frequency of injecting increased in the TOI arm by 6.33% but was reduced in the PDI arm; −63.75% (p<0.0001). Authors conclude that PDI outperforms TOI in reducing drug taking risks. Furthermore, a cost analysis places the cost per IDU recruit at $470 in the TOI arm but only $16 for PDI.

Challenges in using opinion leaders

The difficulties of delivering peer- interventions are many. However, Ziersch et al encountered several problems in their study of peer delivered sexual health promotion among male sex workers in London (Ziersch, Gaffney *et al.* 2000). Eight men working at two agencies were recruited and trained to act as peer educators. A third agency was used as a control. Unfortunately it was not possible to determine the efficacy of the intervention as the turnover of men working at the agencies was so rapid, and often even between the three agencies, that no meaningful comparisons could be made. However, this highlights the importance of ethnographic baseline assessments of intervention locations and ensuring geographical isolation of sites in research settings. It further underlines the critical aspect of stable and cohesive social groups as a key component of innovation diffusion. The researchers also experienced problems with management of one agency who discriminated against the peer educator at that site and restricted the amount of work given to him. As a result, CSWs working at that agency were reluctant to interact with the peer educator. One positive outcome of the study was that a greater number of CSWs attended the dedicated sexual health clinic for sex

workers as a result of recommendations from the peer educators. Interviews with the CSWs who had interactions with peer educators revealed that peers were not always seen as the most appropriate source for sexual health information. In particular there were concerns about confidentiality, uncertainty about the precise role of the peer educators and concerns over potential conflicts of interest between participants and educators.

In general much of this literature relies on self reported efficacy data as a measure of impact rather than incidence of STIs and HIV among those exposed to the intervention. The follow-up time for studies is frequently short and this limits the ability to understand long term impacts of interventions. It may be that interventions which do not appear to be efficacious after a short period of time may become more successful over longer periods of time as the diffusion of messages reaches a tipping point. There is concern about how sustainable these POL and peer-led interventions are, especially in light of the low retention rates of participants recruited as peers at the beginning of studies. Without continued and significant support from researchers and health care professionals there is a real danger that the delivery of health messages fizzles out over time.

The very basis of using peers and POLs to deliver health promotion relies on the fact that they are part of the social network into which you wish to deliver the message. Therefore, by elevating a peer or POL to a status whereby they liaise closely with health agencies and professionals may remove them from the position which made them ideal in the first place. Understanding how recruiting

and training POLs impacts on their position within the social network is not known. Furthermore, communities are diverse and several factors may need to be matched between the POL and the group being targeted. For example, just using gay POLs to deliver health promotion to gay men missed the significance that other factors such as ethnicity and social class may also have for these men. These factors may explain findings in studies such as Miller and NIMH study (Miller 2003;2010).

Summary

In summary, the female centric approach of the NCSP was set up on the basis of three central assumptions: 1) the sequelae are more serious for women and asymptomatic cases have to be detected if the incidence of complications is to be reduced; 2) women are more likely than men to attend a health care setting where screening is feasible; and 3) computer modelling has shown this to be cost-effective. However, as outlined above, the evidence to support these assumptions is not without criticism - opportunistic screening has not been shown to consistently reduce PID in women; too few people are screened and without sufficient levels of partner notification; men frequently attend primary care therefore screening may well be feasible and acceptable to them in those settings; the cost effectiveness of opportunistic screening is not proven in all models.

Understanding the reasons why men do not engage in current screening programmes is poorly investigated and novel approaches are often set up without exploratory background work to support them. This approach is neither

sustainable nor cost effective although some non-traditional settings, including sport venues, appear to be acceptable to men and have enjoyed high rates of participation and treatment. Peers and popular opinion leaders have been used in a number of studies to promote behaviour change related to HIV risk but rarely for chlamydia screening. Whilst it is hoped that embedding these programmes within and empowering the communities they are targeted at will improve success and ensure sustainability, there have been a number of disappointing outcomes to these studies. Findings have not been consistently reproduced in all settings. Whether or not these two approaches of popular opinion leaders and sport settings can be successfully combined is not currently known and is the focus of the studies in this thesis.

Chapter 3: METHODS

Introduction

In the last chapter (Chapter 2: Literature review), I reviewed the current literature relevant to this thesis. This chapter contains the methodology used for the two studies in this thesis and is presented in two parts. The first part is the methodology for the stratified random probability sample survey of men aged 18 to 35 years and resident in Great Britain. This survey explored current health care use, previous sexual testing practices, sexual behaviour and the acceptability of self-taken testing kits for Chlamydia and different venues for collecting these kits. Results of this survey are presented in Chapter 4.

The second part of this chapter contains the methodology for the qualitative interviews which I conducted with men aged 18 years and over who play amateur football as part of a league in Greater London. These interviews explored the acceptability of testing for Chlamydia in football settings and the use of non-healthcare professionals to encourage men to test. Interviews also explored potential processes for testing in these settings as part of preliminary work for a pilot study of testing in football clubs. The pilot study is ongoing and therefore the methodology and results of this are not reported in this thesis. Results from the interviews are presented in Chapters 5 and 6 of this thesis.

Stratified Random Probability Sample Survey Methodology

Background

Over the past decade, there has been a sustained rise in the numbers of most sexually transmitted infections (STI) diagnosed in the UK (Health Protection Agency 2012). The prevalence of infection with *Chlamydia trachomatis*, the most prevalent bacterial STI in the UK, is split equally between men and women (Fenton, Korovessis *et al.* 2001;Macleod, Salisbury *et al.* 2005). Over this time, highly sensitive and specific tests have been developed for the diagnosis of Chlamydia and other infections such as *Neisseria gonorrhoeae* and Human Immunodeficiency Virus (HIV), which can be performed on non-invasive, self-collected samples (Ross, Ison *et al.* 2006;British HIV Association 2008). As a result, testing for STIs and HIV can now be conducted in a variety of non-healthcare settings without the need for access to microscopy or interaction with healthcare professionals. These technological advances have underpinned development of the National Chlamydia Screening Programme (NCSP) in England. Modeling studies have predicted that a significant reduction in the population prevalence of Chlamydia could be achieved as long as at least half of all women attending health services accepted testing annually or within six months of changing their sex partner (Turner, Adams *et al.* 2006) Achieving this threshold, however, remains a challenge.

The NCSP tests twice as many women as men and the venues in which testing is performed differ significantly between genders (National Chlamydia Screening

Programme 2011). Of the NCSP tests done in women, more than 50% are carried out in "core services" (general practice, contraceptive and sexual health services and pharmacies). In contrast, around 25% of tests in men are in "core services", with testing more commonly occurring in "outreach" and non-healthcare settings. Positivity rates of men tested by the NCSP in non-healthcare settings are generally lower than those from men tested in core services (Johnson, Simms *et al.* 2010). This highlights the limited impact that screening men in non-healthcare settings may have on public health, as it is not only the coverage of screening which is important but also ensuring that populations with the highest prevalence of infection are tested (Turner, Adams *et al.* 2006). A greater and faster reduction in chlamydia prevalence may be achieved through including more men in screening (Kufeji, Slack *et al.* 2003) however, the cost-effectiveness of screening more men compared to improved partner notification has been recently questioned (Turner, Adams *et al.* 2011). Despite this concern, it is generally accepted that efforts should be made to engage more men with STI screening and the Department of Health in England has commissioned research to look specifically at this issue.

STI screening within sports settings has been undertaken in the UK and overseas, in a variety of ways and with varying degrees of success, in an attempt to encourage more men to test for STIs and to engage in general healthcare (Powell, O'Connor *et al.* 2004;Kong, Hocking *et al.* 2009;Lorimer, Reid *et al.* 2009). In England, after swimming and cycling, more men aged 16 years and over play football at least once a month than any other sport, and do so in a club infrastructure which could provide support for screening initiatives (Sport

England 2011;Sport England 2011). Although this suggests that football venues could provide feasible settings in which to provide large numbers of men access to STI and HIV testing, the acceptability of this approach is poorly understood.

In this section I report the methodology for a stratified random probability survey which explored the medical, social and sporting venues in which men aged 18 to 35 years and resident in Great Britain find it acceptable to access self-collected testing kits for STIs and HIV. A secondary aim was to determine whether those men who play football would find their football venues acceptable places to pick-up self-collected STI testing kits in an attempt to further understand the acceptability and feasibility of using football settings to engage men in STI testing.

Methods

What is a stratified random probability sample survey?

A stratified random probability sample survey is a survey delivered using a particular sampling method which, as the name suggests, is both a stratified and a random probability sample. This sampling method allows findings to be generalisable to the wider target population without having to survey the entire population.

Probability sampling means that each unit in a sample (the population of interest/ pool of data units) has a certain probability of being selected. For example, if you had a population of 100 and wanted a sample of 10, probability sampling would give a overall probability of 10/100, or 1 in 10, of selecting any one unit from that

population. This could be conducted in a non-random or systematic way, by selecting the first ten in the sample or every tenth member of the population, or in a random way, assigning each member a number and then randomly selecting ten numbers from that list. Random probability sample surveys employ the latter technique to ensure a random selection from the target population.

The advantages of selecting the sample at random is that any bias in the selection of cases is removed or reduced. For example, by selecting the first ten cases in a queue of 100 people, you may inadvertently be selecting cases with specific characteristics, for example people who wake up earlier, or people who don't work and could get in a queue earlier. The impact this has on the data collected may be significant and produce a sample that is unrepresentative of the population as a whole. However, whilst random selection helps to reduce the selection bias, it may not create a sample that is representative of the broader population.

In order to account for this, a stratified sampling technique can be used. This splits the total sample into non-overlapping, homogenous groups or "strata" whereby the sum of all units within the strata equals the sum of the whole sample; i.e split N into n1, n2, n3, n4,…. ni where $\sum$(n1, n2, n3,… ni) = N. These strata can represent any important aspect of the population. For example you could stratify by age, gender, ethnicity, postcode or social class. A random, probability driven, sample is then taken from each strata. This is known as stratified random probability sampling.

Because the proportions that these strata represent within general populations is frequently known, a weighting can be applied to the sample strata to make it not only representative of the general population but also of the key sub-groups within that population. This is known as a calibration weight. For example, if 10 participants are chosen from each strata but n1 is ten times larger than n2 within the general population, then a calibration weight can be applied to make n1 ten times larger than n2.

It is also possible to apply a selection weight. This is used if the chance of selecting individuals within a strata is unequal. For example, when randomly selecting individuals from addresses it is possible that more than one person who is eligible for the study resides at a single address. The more eligible people there are at a single address, the lower the chance of any single eligible person at that address being selected; i.e. if there is single occupancy at a selected address then the chance of being selected is 100% but if 10 eligible people live at an address then the chance is 1 in 10, or 10%. Selection weighting corrects for this potential selection bias.

Stratified random sampling has many advantages over simple random sampling. By taking a random sample from non-overlapping strata rather than the entire population, the sample is more precise - it allows there to be certainty that individuals from each part of the population will be sampled rather than ending up with a random sample from one section of the population by chance and thereby ensuring that the sample is not unrepresentative. Another benefit of this greater

precision is that smaller samples are required to gain a representative sample. This obviously has an impact on the time and money required to collect data. However, because of the more complex methodology, stratified random probability sample surveys may take greater effort to set up during the design phase than a simple random sample.

Stratified random probability sample surveys have previously been used in sexual health research. The best known example in the UK is the National Survey of Sexual Attitudes and Lifestyles (Natsal) which "…is the largest scientific study of sexual behaviour since the pioneering studies of Alfred Kinsey in the US in the 1940s and 1950s." (National Centre for Social Research).

What is the "Omnibus"?

The *Omnibus* is a stratified random probability survey which is delivered quarterly by the National Centre for Social Research (NatCen). Social researchers can purchase space on the Omnibus for their own questions. The survey is then conducted by researchers employed by NatCen before data from the questions which were purchased is sent back to the commissioning research team.

A multistage sampling design technique is used for the Omnibus. Firstly, postcode sectors are ordered according to Government Office Regions and the National Statistics Socio-economic Classification before selecting 153 sectors. Twenty addresses are then selected from the Postcode Address File for each of the 153

postcode sectors. This gives a total sample size of 3060 addresses. Finally, a single participant aged over 16 is selected at random from these addresses. Questions relating to this study were only delivered to men aged between 18 -35 years of age. Appropriate selection and calibration weights were applied to correct for the unequal probability of selection in households of different numbers of occupants and to ensure the weighted distributions matched population totals.

Using the Omnibus allows for rapid data collection as the survey is delivered using computer assisted interviewing techniques by multiple researchers in multiple geographical regions at the same time. This has several advantages in terms of time and cost and allowed me to use existing infrastructures without purchasing new computers and traveling around the country.

Survey Design

Survey design is open to many potential biases and pitfalls and careful consideration of each part of the process is required. As this method relies on using questions to get information from participants, developing the questions to be used is a critical step. Furthermore, within this survey there is an element of sensitivity relating to questions about sex. Ensuring that participants feel comfortable and confident in answering these questions is important if reliable data is to be generated (Fenton, Johnson *et al.* 2001). Therefore, the method of asking questions is critical. Computer assisted techniques were used in the omnibus. However, other techniques could have been used including pen and paper and internet surveys. However, both of these may raise concerns about

confidentiality for participants. Internet surveys also exclude those without access to personal computers.

Designing the survey questions

I developed ten questions (see appendix) designed to explore men's use of general and sexual healthcare; key sexual risk behaviours; participation in sporting activities; and the acceptability of self-collected STI and HIV testing in a variety of medical, social, and recreational settings. I wrote and further refined several versions of the questions after discussion with the wider research team and the NatCen researchers to ensure that they were unambiguous and would produce meaningful and useful responses. Where applicable, I based questions on appropriate National Surveys of Sexual Attitudes and Lifestyles (Natsal) validated questions (National Centre for Social Research 2011).

I piloted questions with the wider research team, non-research sexual health clinicians and researchers at NatCen, to ensure they would be understood by non-sexual health experts, prior to inclusion in the survey. Whilst some of these questions had binary answers (yes or no), for others a range of potential answers were presented to the participants. For example, if a participant answered "yes" to having had a previous STI check up, they were then asked about when they did the test with various time ranges as options.

Questionnaire layout

The survey was delivered using computers and a specific survey programme. The survey programme was tested by the NatCen team for correct routing (making sure that questions are not asked if previous answers render them inapplicable) with internal range and consistency error warnings created prior to use. Internal range error warnings appear on the screen if the participant enters a value which falls outside the possible responses presented to them, for example choosing option 11 when there are only 10 options. Consistency error warnings appear when a participant enters a value which directly contradicts an answer to a previous question, for example, if a participant responds that they have had two new sex partners in the last year and then that nine of these were in the last three months.

Careful consideration was given to what order in which to ask the questions. Other researchers were also using the same Omnibus survey to reach participants for non-health related research. Therefore, I decided, in partnership with the NatCen researchers, that questions which may be more sensitive, for example, those relating to sexual partners, were asked after questions about previous testing behaviour. Questions relating to a similar theme were grouped together to ensure a logical flow through the questions. For example, all questions about STIs followed on from each other whilst those about sporting or recreational activity were placed together. This order was used to gently introduce relevant topics to the participants and the avoid jarring contrast with previous sections and questions. Self-interview techniques were also used for more sensitive questions (see below).

Survey delivery and data collection

Questions were delivered and data collected by field staff employed and trained by NatCen using a combination of face-to-face computer assisted personal- (CAPI) and participant self- (CASI) interviewing techniques in three waves of interviewing between January and October 2010. This method uses laptop computers to guide the interviewer through the questions, ensuring that each question is asked in the same way and in the same order to each participant. Participant responses are immediately entered into, and confidentially stored on, the laptop computers. Furthermore, in an attempt to increase participation and the accuracy of the data recorded, more sensitive questions about sex and health can be completed by participants, without the interviewers seeing responses. This method of survey delivery has been used frequently in sexual health research, for example in the National Surveys of Sexual Attitudes and Lifestyles (NATSAL) (National Centre for Social Research 2011). It has been shown to produce accurate and reproducible data (Van Duynhoven, Nagelkerke *et al.* 1999;Richens, Copas *et al.* 2010). On average, interviews lasted between 25 and 30 minutes. The Omnibus is conducted in accordance with the Social Research Association Ethical guidelines (Social Research Association 2003) with informed consent taken verbally at the time of interview. Coding of the data was performed by researchers at NatCen. Free-text responses to questions were back-coded where possible into existing codes for that question. New code frames were created for open questions from responses given in initial interviews.

Face-to-face interviewing was chosen rather than postal, telephone or internet interviews because it results in the highest participation rates (Galea and Tracy 2007). In general terms, using surveys is an effective and relatively cost effective way of producing large amounts of data in short periods of time. This was important in this study as it formed part of a programme of research with strict deadlines for reporting. Results from this study also feed into other studies within our larger programme of research.

Non-response

Ensuring adequate participation in the survey is important for two main reasons. Firstly, non-response may lead to an unacceptable reduction in sample size, such that statistical significance cannot be demonstrated between groups. Secondly, it introduces bias into the sample as there may be something inherently different about the non-responders when compared to responders.

Non-response can be due to three main reasons.

1. Absence: In this type of non-response, the potential participant was not present to take part in the survey.

2. Reluctance: The participant may not want to take part in the survey. This is of particular concern in sexual health research whereby the subject matter may put people off.

3. More pressing issues: Participants have other, more important things to be doing than answering a survey.

Several methods were used in order to minimise the risk of non-response. Firstly, selected participants were sent an invitation letter prior to the interview together with an unconditional £5 voucher. This highlighted to the participant that the survey was taking pace and when an interviewer would be calling. An opportunity to reschedule the interview was also given. Secondly, interviewers called at each address on at least six, and a maximum of nine separate occasions at different times of the day and week, including evenings and weekends, before an address was recorded as a non-response. The first three calls were conducted after 6pm on Monday to Thursday or at a weekend. This helped to minimise the risk of absence and overcome the call of more pressing issues. The use of computer-assisted self interviewing techniques for more sensitive questions about sexual behaviour helps to overcome reluctance to take part. This technique has been shown to produce reliable behavioural data (Richens, Copas *et al.* 2010).

Sample size and statistical methods

A sample size of 225 men aged 18 to 35 years was calculated by Dr Catherine Mercer (University College London), the study statistician, to provide adequate statistical power (80%) to detect as significant differences in key predictors at the 5% level. The Omnibus is conducted every three months (i.e. once a quarter) and over the course of three Omnibus waves, data were collected from 411 men, enabling more precise estimates to be obtained.

The Chi-square statistic was used to detect statistically significant differences in proportions between men aged 18-24 years, men aged 25-29 years, and men aged 30-35 years. Data were analysed by Dr Catherine Mercer after discussion together and using the statistical package STATA to account for the complex survey design of the Omnibus survey. Statistical significance was considered as $p<0.05$ for all analyses.

Whilst the NCSP targets men and women aged 25 years and under (those with the highest prevalence of Chlamydia), the research in this thesis focuses on men aged 18 to 35 years. This is for a number of reasons. Firstly, individuals under the age of 18 are considered children. Pragmatically, conducting research with children adds several layers of complexity to the process. In terms of the research that I have conducted in football clubs, the club structure for under-18 teams is very different to that for older men. The relationship between children and coaches is more hierarchical and would impact on the decision of whether or not to take up the opportunity to test. Secondly, for the most part, clubs arrange teams by age. Most teams are made up from 18 to 35 year olds. Men over the age of 35 are put into veteran teams. Therefore, restricting my research to 18 to 35 year olds ensured that findings from the qualitative work could be directly applied to teams used in the pilot study.

Results of this study are presented in Chapter 4.

Qualitative Interviews Methodology

Background

The English National Chlamydia Screening Programme (NCSP) opportunistically tests men and women for Chlamydia in a variety of healthcare and non-healthcare settings. These settings are grouped into 'Core' and 'non-Core' services for the purpose of data reporting. Core services include Contraceptive and sexual health (CASH) services, General Practice, Pharmacies and Termination of Pregnancy (TOP) services. Settings falling outside of these core venues include educational, military, outreach, prison and youth settings. Overall 42.4% of all tests carried out by the NCSP between April and Dec 2010 were conducted in Core Services with a Chlamydia positivity rate of 5.4% (National Chlamydia Screening Programme 2011). However, when data for men and women are examined separately, there are important differences in where testing was conducted, coverage of screening and positivity rates. Over the same time period 53.8% of tests in women were conducted in Core Services compared to just 25.2% of tests in men with a coverage rate of 23.8% *vs.* 11.8%, respectively. Positivity rates were 5.7% in women and 4.7% in men.

The reasons for these gender differences in where tests are carried out are multiple and understanding them is important if coverage of screening is to be increased. Clearly how men access 'Core Services' is likely to be different to how women access them, in particular TOP and contraceptive services. Pharmacies are also unlikely to appeal to men as a location to access health care, with these spaces

considered feminised (Granville 2009). Rhetoric amongst healthcare providers and society in general assumes that men are reluctant to visit their GPs and attend less frequently than women. However, whilst significant social barriers to accessing general practice certainly exist for men (impact of masculinity on health seeking/ expectation to work and time barriers etc) there is evidence that a significant proportion of young men are likely to have been in contact with their GP within a 12 month period (Salisbury, Macleod *et al.* 2006). These episodes of contact offer potential opportunities to engage men in Chlamydia screening and challenge the assumption that there are fewer opportunities to screen men in healthcare settings.

These underlying assumptions about men being hard to reach and not wanting to attend health settings for screening help to drive forward testing events located in community and non-traditional settings. The public health benefit of these is questionable when considering the low positivity and coverage rates achieved (Kufeji, Slack *et al.* 2003;Johnson, Simms *et al.* 2010). Regional NCSP screening offices were also incentivised financially to achieve overall screening targets rather than to detect infection.

The issues are further complicated by the fact that even when men are approached in non-core services the uptake and overall coverage of testing amongst men remains lower than for women (National Chlamydia Screening Programme 2011). This suggests that the problem is not just about finding opportunities to test men but also touches on how to persuade men to test once they have been offered a test.

A recent review of factors associated with attitudes to Chlamydia screening in men highlights several factors which impact on likelihood of men accepting screening (Balfe, Brugha *et al.* 2011). Two key unifying themes were identified; (1) men's needs to make positive impressions on others and (2) identification with ideals of masculinity; both often overlooked when developing screening events.

Sport settings have been used as testing venues in few studies as has sporting imagery in an attempt to engage men with screening (Kong, Hocking *et al.* 2009) (see image 1 and 2 below). The messages promoted in these campaigns are strongly aligned to ideals of masculinity and almost celebratory of "lad culture". Whilst it seems feasible to screen in these settings, the acceptability of them has not been investigated formally.

Image 1 and 2

I conducted face-to-face, semi-structured interviews with footballers and coaches to understand the acceptability of offering Chlamydia testing in the football clubs and to explore how best to offer testing in that setting. This work has been

conducted as a preliminary piece of work for a pilot randomised controlled trial of Chlamydia testing in football clubs.

Ethical approval was granted by the Queen Mary University of London Ethics Committee.

Methods

In order to explore men's attitudes towards testing for *Chlamydia trachomatis* in football clubs, I have used face to face qualitative interviews rather than a quantitative survey design. Interviews and qualitative analysis allowed me to explore why men feel certain things about testing and to get a deeper understanding of how to use football clubs to engage them with testing in a way that quantitative methods would not allow. This is of importance when using the findings to develop a pilot study of testing in football clubs as it truly underpins the development of testing pathways - each step can be justified based on findings from the interviews.

One to one interviews, rather than focus groups, were used in this research as they allow participants the opportunity to discuss personal issues without feeling inhibited by the presence and opinions of other people. This is important when discussion includes sensitive topics, for example sexual health, as social desirability may bias participant response. It also allows the researcher to focus specifically on one participant's point of view and explore their reasoning behind

them. Whilst focus groups can be helpful in promoting discussion and help participants to consider alternative opinions, it is also possible to explore these in one to one interviews by using prompts within the topic guide. Focus groups also explore group and societal norms rather than personal experiences.

Research Team and Reflexivity

A major difference between qualitative and quantitative research methods is the way data is collected and analysed. In this study, I am effectively the research tool and, as such, my personal characteristics have an impact on how and what data is collected and interpreted. For example, the way in which I approach participants and the way in which they perceive me may affect what is said in the interviews. Any assumptions I have about what participants will say and think about chlamydia testing in football clubs may bias my approach and interpretations. Likewise, my reasons for doing the research in the first place may also bias my actions.

For these reasons, I present here an overview of my personal characteristics and a description of my relationship with participants in an attempt to ensure transparency of the research process. I hope that in doing this, readers will have a greater understanding of how these factors may impact on the research process, findings and interpretation.

Philosophical assumptions

As with all research, quantitative and qualitative, the underlying philosophical assumptions made by the researcher impacts on the study design, data collection, analysis and interpretation. Therefore, in order for readers to understand the findings of this research better I present my own assumptions about the nature of the social world (my personal ontology) and the nature of knowledge and it's acquisition (my personal epistemology). As will be clear below, my training as a medic has primarily been through acquiring knowledge which was produced from quantitative, positivist studies with assumptions that there is a single objective truth (positivist realism). However, whilst this approach may be suitable (or not) for hypothesis testing in biomedical systems, it seems an inelegant way to "…study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meaning people bring to them." (Denzin and Lincoln 2000). Indeed, some researchers assert that qualitative research is anything "… that produces findings not arrived at by statistical procedures or other means of quantification…" thereby positioning it in direct opposition to the philosophies underpinning quantitative research (Strauss and Corbin 1998).

Pragmatism, on the other hand, recognises that a mixture of qualitative and quantitative methodologies can be combined in research, especially for health service research. This is because certain methodologies may not be suitable for all research questions and a greater, more holistic understanding may be gained by using mixed methods. This is certainly my position when it comes to my research - qualitative and quantitative methods can sit together to more fully explore and

explain phenomena. Although this can cause tensions between the underlying philosophies of the different approaches, being rigid and purist about philosophical positions limits our ability to understand systems and processes.

Therefore, whilst I feel that interpretivism - "…the researcher and the social world impact on each other, facts and values are not distinct and findings are influenced by my perspective and values, methods for investigating the natural sciences are not appropriate for researching the social world…" (Ritchie and Lewis 2008) - is the appropriate epistemological stance for conducting these interviews, I also believe that positivism is appropriate for quantitative research in natural sciences. My ontological stance is one of subtle realism - "…an external reality exists independently of our beliefs and understanding but that this reality is only knowable through the human mind and socially constructed meaning…" (Ritchie and Lewis 2008).

Personal characteristics

I conducted all the interviews. At the time of the interviews I had been a full time PhD student at Barts and The London School of Medicine and Dentistry for two and a half years. However, before enrolling as a PhD student I had been working as a junior doctor in Sexual Health and HIV medicine for three years and in general medicine since graduating as a doctor in 2001. I have an undergraduate degree in medicine (M.B., B.S.) as well as post graduate diplomas in general medicine (Membership of the Royal College of Physicians, MRCP), genitourinary

medicine (Diploma of Genitourinary medicine, DipGUM) and reproductive and sexual health (Diploma of the faculty of reproductive and sexual health, DFRSH).

Other members of the research team were involved in developing the study, topic guide and various stages of analysis. Dr Claudia Estcourt is Reader of Sexual Health and HIV at Barts and The London School of Medicine and Dentistry and had the initial idea for the study. She has a clinical background and her research focusses predominantly on service development and novel methods for partner notification. She helped to develop the topic guide and to interpret the interview findings but did not conduct any interviews. Ms Lorna Sutcliffe is a senior researcher and research manager at Barts and The London School of Medicine and Dentistry. She has a background in nursing and midwifery and experience of designing and conducting qualitative studies. She was involved in developing the topic guide and analysing the transcripts. Professor Graham Hart is Dean of the Faculty of Population Health Sciences at University College London. He has extensive experience in designing and conducting qualitative studies and was involved in designing the topic guide.

Before starting the interviews I attended taught courses on the design and analysis of qualitative research and on conducting depth interviews at the National Centre for Social Research (NatCen). These courses were held over several days and included practical sessions on all aspects of qualitative research. Together with support from my supervisors and wider research team, they allowed me to conduct this study and to develop my skills as a qualitative researcher. However, I

acknowledge that my overall experience of qualitative research is small and that this will have an impact on how the study was conducted.

Relationship with participants

Specific details about selection and recruitment of participants are given in the section below. However, I present here a general overview of my relationship with participants.

I did not actively establish any kind of relationship with participants before the interviews were conducted. With the exception of the pilot interviews, the only contact that I had with participants before the interviews were brief telephone and email exchanges. The two pilot interviews were conducted with friends of mine who played football in amateur clubs. They were chosen so that I could build my confidence with the interview process with people that I felt comfortable with and to help refine the topic guide before interviewing people that I didn't know personally. This was an important step in the research process as I wanted to ensure I felt confident conducting subsequent interviews and would appear competent and professional for participants, something I hoped would encourage participants to talk openly and freely.

In order to consent to participate in the interviews, participants were told the purpose of the research, with reference to the larger programme of research, and that I would be using the interviews as part of my PhD thesis. Participants were

aware that I was a sexual health physician as I thought that withholding this information would be dishonest. However, I was concerned that they may alter their responses because they knew this or use the interviews as an opportunity to ask questions relating to their sexual or general health. In reality, I do not think this had a major impact on the process and may have helped participants to feel at ease discussing issues relating to sexual health as they knew I was used to discussing these issues. Any questions asked during the interview about personal situations were dealt with once the interviews had finished.

Before starting the interviews, I reflected on my own reasons for doing the research and interest in the topic, assumptions about what I would find and how these may bias or influence the process. My motivations for conducing the research were multiple, although initially these were mostly related to professional development and career progression with the award of a PhD. However, I also have an interest in men's sexual health, public health and service development. It became apparent to me during the research process that the experience would also have an impact on my clinical practice, approach to future patients and deeper understanding of patients' experiences of sexual health services.

Although I do have an interest in service delivery and developing new models of care in non-healthcare settings, my personal interest in sport and football is not very great. I have rarely watched an entire football match and the last time I played a team sport was probably almost 20 years ago. I considered how this

might impact on my approach to the interviews and especially whether or not it would have an effect on my understanding of the issues raised by participants. On the one hand I was concerned that men would assume I had an understanding of terminology and what it was like to play football on a weekly basis and that without this knowledge I would miss subtle nuance in what was said. On the other hand, I wondered whether my lack of personal experience with team sport would allow me to avoid assumptions and more deeply probe issues which were raised.

I also thought about how participants would view me and the wider assumptions they might have about me. In particular, I imagined that they would expect me to have a deep interest in football, given that I was writing a PhD thesis about testing for sexual infections in football clubs. I was also concerned that they would assume I was similar to them, not only sharing a love for the beautiful game, but perhaps also extending to a common sexuality and attitudes to sex and sexual health. In fact, I wanted men to think I was similar to them so that they would feel comfortable in sharing their experiences. However, at times, this made me feel slightly uncomfortable because I felt I was colluding with them or actively hiding my true self.

Based on some preliminary and unpublished work done with professional football coaches by a medical student in the research team a few years ago, I thought that coaches would be happy to promote testing among men. I was also optimistic about attitudes after a discussion with a community partner in the research who had played professional football in the past and thought that players would follow

advice from coaches without question. His comments also suggested that men would rather not have too much information on the testing. However, I recognised that the interviews I would be conducting were not with professional coaches and players and that attitudes may be different because of this. The findings from the omnibus study also suggested that only around half of men who played football regularly would find their football venues acceptable pick up points for testing kits.

Participant selection

Sampling

I considered a number of methods for participant selection but because of the challenges faced in approaching and selecting participants, I used a mixture of convenience and snowball sampling. Therefore, the sample characteristics of the participants is not as diverse as would have been seen if using a purposive sample (see below). However, it is broadly reflective of the demographic in the football clubs that were used and some key differences exist between participants (age, relationship status, sexual orientation, educational status, previous testing history and previous STI diagnoses). This helps to add diversity to the findings.

More details about approaching clubs is given below but participants were selected based on whether or not they contacted me to take part in the study (convenience sampling). After the interviews I encouraged them to promote taking part in the research amongst their team mates and this produced some more participation (snowball sampling).

Method of approach

The Amateur Football Combination (AFC, www.amateurfootballcombination.com) is: "*one of the biggest adult football leagues in Europe, with around 100 clubs and 350 sides playing Saturday afternoons in and around London…*". Because of it's location, size and level within the league pyramid it was used as the sampling frame for both stages of the study. Many of the clubs paying within the AFC have websites and, whenever possible, I looked at these before contacting clubs to get a feeling about whether the club would be suitable for the interview or pilot stage. This was primarily based on whether or not they had their own club house and grounds and how many teams they had. Following that, emails were sent to the club secretaries introducing our research team and the study and asking if it would be possible to arrange a telephone or face to face meeting to discuss the study in more detail. These meetings gave me an opportunity to learn more about their clubs (how many teams, demographics of the club, club infrastructure) and also to see if the club might be interested in taking part in the research. If they were interested then I went on to discuss which stage of the study might be more suitable for their club (interviews *vs.* pilot trial). Club secretaries then discussed it with the club committees before agreeing or declining to take part.

Clubs which agreed to take part in the interviews disseminated study information to their members using email and club newsletters. Participants were asked to contact me directly if they were interested in taking part. This process took many months as initial calls for interest did not result in any men coming forward to be

interviewed. Therefore I made several follow up calls to the club secretaries and asked for them if they would be happy to resend information to members. Eventually I had a few participants contact me and I began the interviews. Following those initial interviews I had a rapid uptake from other men who had heard by word of mouth about the interviews and how easy they were to do. As saturation was reached I still had interested men coming forward who had to be turned down.

Participants were given £20 for their time. Clubs received £10 for each participant from their club that took part for the time it took to disseminate information to club members.

Sample size

Nineteen interviews were conducted with participants from five different clubs. Two of these were conducted as pilots with friends of mine. One of these pilots has been included in the analysis as they met inclusion criteria (between 18 and 35 years old and currently playing football in an amateur club). The other is not included as they were older than 35.

Consent

Ethical approval was granted for the study by the Queen Mary University of London ethics committee. Verbal and written information was provided to all participants. Written consent was taken from the participants before the interviews

were conducted. Participants were free to withdraw consent at any point up until analysis of the anonymised data. No participants withdrew consent.

Non participation

As potential participants were not approached directly by the researcher to take part, it is not possible to report a refusal rate. It would be possible to report the number of participants from clubs as a percentage of the total number in the club. However, I do not think this is especially helpful to report as qualitative research is about the breadth of experiences rather than getting a particular sample size. Around 25 of the 100 clubs in the AFC were contacted by email to participate in the study. Only six clubs responded and men from five clubs took part in the interviews.

Data collection

An interview topic guide (see appendix) was developed by myself with input from other members of the research team (Lorna Sutcliffe, Graham Hart and Claudia Estcourt). Interviews started with general questions about the participant and their involvement with the football club. This was to allow the rest of the interview to be seen in context of their age, background and reasons for playing team football. These initial questions were also considered fairly unthreatening and helped to create a rapport between myself and the participants before moving onto potentially more sensitive questions about attitudes to sexual health and testing for chlamydia. Following these background questions, I asked about attitudes to general health promotion within the football club setting. I used these questions as

an opportunity to draw out general thoughts and ideas about health promotion in the football clubs before asking specifically about sexual health promotion. It allowed me to gain an overview of how health was viewed by men and to challenge apparent contradictions in attitudes to sexual health versus general health.

The topic guide then became much more structured and asked about attitudes to the proposed models of chlamydia testing (coach led, health professional led, poster led). Because explaining the proposed models was challenging to do and, from conversations with colleagues and friends, could be difficult to visualise, I produced a series of pictorial flow charts showing the specific steps involved (see appendix). This helped participants to understand what was being proposed and to ask questions about each stage of the testing pathways.

In order to have a preference about a new way of testing, I felt it was important for men to have an understanding about what traditional options for testing looked like. This would allow men to compare and contrast the proposed models with standard testing in traditional settings. Without this I felt it would be difficult for men who had a poor baseline knowledge of STI testing to appropriately assess the potential advantages and disadvantages of testing in football clubs. Therefore the first pictorial representation of testing was a traditional testing pathway involving visiting a clinic for urine testing. Subsequent pathways then showed coach led, health professional led and poster led promotion in football clubs.

The topic guide was tested on two personal acquaintances who were either currently involved in playing football for a team or had been in the past. These pilots enabled me to become more comfortable with the flow of the questions, develop language to use when asking questions and to ensure the questions were ordered appropriately. Following these pilots extra questions were added to make sure that the relationship status of the participants was known as this was felt to have a potential impact on attitudes to testing. Pilots were listened to with a second researcher (Lorna Sutcliffe), who has more experience with qualitative research, in order to get feedback and suggestions for future interviews.

Interviews were conducted in a number of settings and at different times of day depending on what was most convenient for the participant. Most commonly this was at their place of residence in the early evening (after work) but other settings included the research offices at St Bartholomew's Hospital, their place of work, and the training grounds. No one else was present during the interviews. All the interviews were conducted in Greater London between October and December 2011.

Participants were interviewed only once over a period of between 40 and 70 minutes. They were digitally recorded in order to ensure accurate documentation of what was said and to allow the researcher to concentrate on participant responses. Recordings were transcribed verbatim with participant identifying information removed. Some brief field notes were made following the interviews and used to help contextualise the interviews. Questions were open-ended with

further, more directive questioning used to explore the reasons behind attitudes and statements.

New participants were accepted for interviewed until saturation was reached.

Data analysis

A framework approach was used in this research (Ritchie and Spencer 1994) . This was chosen because of the practical and applied nature of the research to answer questions about health service development. Whilst this approach is based in the original accounts and observations of the participants and therefore "grounded" and inductive, it uses a priori categories to analyse the data. Multiple researchers can analyse transcripts simultaneously in order to reduce bias and reach consensus. The process consists of five main components.

1. Familiarisation

After conducting the interviews, I listened to the taped recordings and read through the transcripts many times to familiarise myself with the raw data. During this I also made notes in the margins of transcripts and in a notebook of recurring themes, ideas and thoughts that I had about the data.

2. Identifying a thematic framework and developing a coding framework

Through this process of re-reading the transcripts key and emergent themes were identified and provisionally organised based on the a priori research questions. Codes were developed based on key phrases and responses in the interviews. This process was done on an initial sample of four transcripts by myself and Lorna Sutcliffe, a researcher who is experienced in framework analysis.

The initial step in this process was to code the transcripts line by line according to what idea was being expressed by the participant. In this way a long list of codes was created. The next step was to group together closely related codes under broader headings. These new codes were then used in the next "indexing" stage.

3. Indexing

These codes were systematically applied to these initial interviews by myself and LS independently of each other before comparing our coding. Discrepancies in how we applied the coding were discussed, a consensus agreed and alterations made to the coding tree. I then systematically applied these codes to the remaining interviews.

Because I started this process of familiarisation, developing a coding framework and indexing before I had completed all the interviews, I was able to recoginise key themes whilst interviewing subsequent participants. Because of this, I could more fully probe ideas during the interviews if data were lacking from previous ones. Therefore, the process of analysis and data collection was an iterative one.

4. Charting

Microsoft excel was used to chart and manage the data. This was used instead of specific Qualitative data management software because of familiarity with the software and limited time to learn new systems. Major and sub-themes were developed and defined during this process. Key excerpts from the interviews were placed into the charts to ensure that the findings are grounded in what the participants said. The charting process allows for experiences and responses to be compared within and between cases.

5. Mapping and interpretation

During this stage ideas and meanings behind the data were developed through discussion, writing descriptive accounts of the findings, looking for relationships between themes and testing the findings back against the initial research questions and transcripts.

Results of the interviews are presented in Chapters 5 and 6. Chapter 5 presents the social context for young men playing football. Chapter 6 contains practical issues for delivering chlamydia testing in football clubs.

CHAPTER 4: STRATIFIED RANDOM PROBABILITY SAMPLE SURVEY RESULTS

Introduction

In the previous chapter (Chapter 3) I explained the methodology for a stratified random probability sample survey which explored the medical, social and recreational venues in which men aged 18 to 35 years, and resident in Great Britain, find it acceptable to access self-collected testing kits for STIs and HIV. In this chapter I present the findings of that study. As the most popular sport undertaken by young men in the UK, there is a particular focus on football clubs as settings for screening.

This study aims to answer the following research questions:

1. In which venues do men aged 18 to 35 find it acceptable to access self taken testing kits for Chlamydia and HIV?

2. Do men who play football find the venues in which they play football acceptable pick-up points for self-testing kits?

Results

The three waves of the survey were completed by almost 3500 people and had an overall response rate of 53%. The median age of men was 28 years, with 130 men (38.9%) aged 18-24 years, 124 men (28.2%) aged 25-29 years, and 157 men

(32.9%) aged 30-34 years (unweighted denominators). The results are presented here for all men, by age, and for men who play football compared to men who do not.

Healthcare use and previous STI/ HIV testing

Almost all (93.5%) men were registered with a general practice and 75.3% had seen their general practitioner (GP) within the last year (Table 1), with no difference by age group. 28.7% and 19.8% of all men had previously tested for STIs and HIV, respectively. Men who played football in the last 4 weeks were no more nor less likely to be registered with a GP (91.7% versus 94.5%, p=0.3468), to have seen their GP in the last year (71.8% versus 77.7%, p=0.2413) and to have ever tested for an STI (30.9% versus 27.6%, p=0.5009) or HIV (22.7% versus 18.1%, p=0.340) suggesting that health seeking behaviours in general are no different for footballers.

Among those who had tested for STIs, 68.2% (95% CI 52.2% to 80.7%) of men under 25 years of age had done so in the last year compared with 30.4% (95% CI 17.1% to 48.1%) of men aged 25-29 years and 9.1% (95% CI 2.3% to 29.8%) of men aged 30-35 years (p<0.001). Time since last test did not show any statistically significant difference between footballers and non-footballers.

The majority of STI and HIV tests had been performed in a clinical setting with over half (53.4%) of all men reporting testing in sexual health (GUM) clinics,

while approximately one in six (17.1%) had tested in general practice. Whilst older men were more likely to have previously testing in GUM settings (64.4% of men aged 30 to 35 compared to 44.7% of men aged 18 to 24), younger men were more likely to have used general practice (24.7% versus 12.2% of men aged 25 to 29 and 12.6% of men aged 30 to 35), educational settings and internet testing. None of these reached statistical significance however. A small number of men reported testing for STIs in non-clinical settings. Testing patterns for footballers echoed those for men as a whole.

Of the men who had previously tested for HIV, those under 25 years were more likely to have tested in the last year than older men; 69.9% (95% CI 45.7% to 86.5%) and 20.0% (95% CI 10.4% to 35.0%) respectively (p=0.0004). As with testing for STIs, HIV testing was most likely to have occurred in GUM (50.8%) and healthcare settings. 16% of all men had received an HIV test at their general practice surgery with 27.1% of men aged 18 to 24, 9.1% of men aged 25 to 29 and 12.9% of men aged 30 to 35 reporting testing in that setting. Older men were more likely to have used private health clinics to test for HIV with no men under the age of 25 reporting having been tested privately. Again, patterns of testing in footballers were no different to those seen in non-footballers.

Table 1: Factors related to health service use among men aged 18 to 35 years

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
Denominator (unweighted, weighted)	411, 632	130, 246	124, 178	157, 208		134, 206	277, 426	
Demographic factors:								
Age								
Median (lower, upper quartiles)								
18-24 years	38.9%, 246 (33.6-44.5)							
25-29 years	28.2%, 178 (23.6-33.3)							
30-35 years	32.9%, 208 (28.2-38.0)							
Health service use:								
Registered with a general practice (GP) surgery	93.5%, 591 (90.2-95.7)	92.5%, 228 (86.6-96.0)	93.5%, 166 (84.8-97.5)	94.8%, 197 (90.0-97.3)	0.7781	91.7%, 189 (84.0-95.9)	94.5%, 403 (91.1-96.7)	0.3468

130

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
Been to GP in the last 12 months	75.3%, 476 (70.2-79.8)	73.9%, 182 (65.1-81.1)	78.4%, 140 (69.3-85.3)	74.1%, 154 (65.2-81.4)	0.6941	71.8%, 148 (62.4-79.6)	77.7%, 331 (71.8-82.7)	0.2413
Ever been tested for a STI	28.7%, 181 (23.9-34.1)	27.1%, 67 (19.4-36.6)	34.8%, 62 (26.4-44.2)	24.8%, 52 (17.3-34.1)	0.2754	30.9%, 80 (23.4-39.6)	27.6%, 118 (21.9-34.2)	0.5009
Time since last STI test					0.0001			0.5700
Less than 1 month ago	4.4%, 8 (1.6-11.8)	9.3%, 6 (2.8-26.4)	2.3%, 1 (0.3-15.1)	0%, 0		4.9%, 4 (1.1-17.2)	4.3%, 5 (1.0-16.7)	
>1 month but <6 months	10.0%, 18 (5.4-17.9)	15.1%, 11 (6.2-32.4)	11.5%, 7 (5.0-24.5)	0%, 0		15.3%, 12 (6.7-31.2)	6.6%, 8 (2.6-15.9)	
>6 months but <1 year	25.2%, 46 (17.1-35.6)	43.8%, 29 (28.2-60.7)	16.6%, 10 (6.2-37.4)	9.1%, 5 (2.3-29.8)		24.5%, 20 (12.5-42.6)	25.7%, 30 (15.2-40.0)	
>1 year but <5 years	37.0%, 67 (28.7-46.1)	30.2%, 20 (17.9-46.0)	44.5%, 28 (30.0-60.0)	36.7%, 19 (22.2-54.0)		38.9%, 31 (25.3-54.6)	35.7%, 42 (25.0-48.0)	
>5 years ago	23.4%, 42 (16.3-32.3)	1.7%, 1 (0.2-11.5)	25.1%, 16 (13.5-41.9)	54.3%, 28 (34.9-72.5)		16.6%, 13 (8.4-30.2)	27.8%, 33 (17.9-40.3)	

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
Where were you last tested for STIs					0.2723			0.4537
GUM clinic	53.4%, 97 (43.5-63.1)	44.7%, 31 (28.2-62.5)	55.1%, 34 (38.6-70.5)	64.4%, 33 (46.6-78.9)		49.8%, 40 (34.4-65.2)	55.8%, 66 (42.4-68.4)	
GP surgery	17.1%, 31 (10.9-25.8)	24.7%, 16 (13.1-41.7)	12.2%, 7 (5.8-24.0)	12.6%, 7 (4.2-32.6)		17.3%, 14 (8.6-32.0)	17.0%, 20 (9.1-29.5)	
NHS walk-in centre	8.3%, 15 (3.3-19.0)	12.1%, 8 (4.0-31.5)	9.9%, 6 (2.3-34.4)	0%, 0		8.5%, 7 (2.1-28.9)	8.1%, 9 (2.4-24.0)	
Family planning clinic	6.6%, 12 (2.9-14.5)	3.5%, 2 (0.5-21.6)	9.6%, 6 (3.8-22.1)	7.2%, 4 (1.6-27.2)		10.5%, 8 (4.1-24.7)	4.1%, 5 (0.8-17.9)	
University/ college health centre	4.4%, 8 (1.5-12.2)	10.4%, 7 (3.3-28.7)	1.2%, 1 (0.2-8.5)	0%, 0		0.%, 0	7.4%,9 (2.5-19.5)	
Private medical clinic	1.7%, 3 (0.5-5.5)	1.6%, 1 (0.2-11.0)	1.1%, 1 (0.2-8.0)	2.8%, 1 (0.4-17.3)		1.6%, 1 (0.2-10.6)	1.9%, 2 (0.4-7.6)	
Pharmacy	0.9%, 2 (0.1-6.6)	0%, 0	0%, 0	3.7%, 2 (0.5-22.8)		2.4%, 2 (0.3-15.4)	0.%, 0	

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
Internet test	1.1%, 2 (0.2-7.9)	3.0%, 2 (0.4-18.9)	0%, 0	0%, 0		2.9%, 2 (0.4-18.3)	0.%, 0	
A&E department	1.3%, 2 (0.3-5.4)	0%, 0	2.3%, 2 (0.3-15.1)	1.9%, 1 (0.3-12.7)		3.3%, 3 (0.8-13.2)	0.%, 0	
Somewhere else	5.0%, 9 (2.0-12.0)	0%, 0	8.6%, 5 (2.6-25.1)	7.5%, 4 (1.8-26.3)		3.8%, 3 (0.5-23.1)	5.8%, 7 (2.2-14.6)	
Ever had a blood test for HIV	19.8%, 125 (15.7-24.6)	15.7%, 39 (9.7-24.2)	25.9%, 46 (18.3-35.2)	19.3%, 40 (12.9-27.8)	0.1724	22.7%, 47 (15.6-31.9)	18.1%, 77 (13.5-23.9)	0.3430
Time since last HIV test					0.0120			0.1543
Less than 1 month ago	10.4%, 88 (4.3-23.2)	19.6%, 8 (5.9-48.4)	7.4%, 3 (1.4-30.7)	4.2%, 2 (0.6-25.5)		18.7%, 9 (6.5-43.3)	4.4%, 3 (1.1-16.5)	
>1 month but <6 months	11.1%, 70 (5.0-22.8)	24.5%, 9 (9.1-51.3)	5.8%, 3 (1.3-22.6)	3.2%, 1 (0.4-20.8)		17.9%, 8 (6.6-40.4)	6.1%, 5 (1.7-19.5)	
>6 months but <1 year	14.7%, 93 (7.1-27.9)	25.9%, 10 (9.5-53.8)	8.7%, 4 (2.6-25.0)	10.1%, 4 (2.3-34.6)		10.9%, 5 (2.5-36.5)	17.4%, 13 (7.5-35.6)	

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
>1 year but <5 years	37.7%, 238	30.1%, 12	38.3%, 18	45.6%, 18		24.8%, 12	47.2%, 36	
	(26.3-50.7)	(13.5-54.4)	(22.3-57.4)	(25.1-67.6)		(11.4-45.8)	(31.7-63.3)	
>5 years ago	26.1%, 165	0%, 0	39.9%, 18	36.9%, 15		27.8%, 13	24.9%, 20	
	(17.0-37.9)		(23.4-59.2)	(19.3-59.0)		(13.9-48.0)	(13.7-40.7)	
Where were you last tested for HIV					0.1980			0.6670
GUM clinic	50.8%, 321	45.9%, 18	59.2%, 28	45.1%, 18		53.6%, 26	48.8%, 37	
	(38.2-63.4)	(23.8-69.8)	(40.1-75.9)	(25.1-66.7)		(32.7-73.4)	(33.1-64.7)	
GP surgery	16.0%, 101	27.1%, 11	9.1%, 4	12.9%, 5		19.6%, 9	13.8%, 11	
	(8.1-29.3)	(10.1-55.2)	(2.1-31.8)	(3.9-34.9)		(6.9-43.7)	(5.5-29.9)	
Family planning clinic	6.7%, 42	10.7%, 4	6.3%, 3	2.7%, 1		8.2%, 4	5.2%, 4	
	(2.8-15.2)	(2.9-32.7)	(1.5-23.0)	(0.4-17.9)		(2.0-28.6)	(1.5-15.9)	
Private medical clinic	5.7%, 36	0%, 0	5.0%, 2	13.3%, 5		6.6%, 3	5.1%, 4	
	(1.8-16.6)		(1.1-20.2)	(2.9-43.9)		(0.9-35.4)	(1.5-15.9)	
NHS walk-in centre	4.4%, 28	13.6%, 5	0%, 0	0%, 0		7.1%, 3	2.5%, 2	
	(1.0-17.6)	(3.1-43.4)				(1.0-37.3)	(0.3-16.0)	

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
University/ college health centre	4.1%, 26 (1.2-12.8)	0%, 0	5.8%, 3 (1.3-22.8)	6.5%, 3 (0.9-35.2)		0%, 0	7.1%, 5 (2.2-21.1)	
A&E department	1.2%, 7.6 (0.2-8.2)	0%, 0	3.0%, 1 (0.4-19.2)	0%, 0		0%, 0	2.0%, 2 (0.3-13.6)	
Somewhere else	11.0%, 70 (5.4-21.0)	2.6%, 1 (0.3-17.6)	11.7%, 5 (3.5-32.5)	19.6%, 8 (7.8-41.5)		5.2%, 2 (0.7-30.0)	15.3%, 12 (7.4-28.8)	

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Behavioural factors

86.2% of all men reported at least one sexual partner in the last year with 73.4% reporting at least one sexual partner over the last three months (Table 2). Younger men reported greater numbers of sexual partners over the last year, and last three months compared with men in older age groups ($p<0.001$ and $p=0.003$, respectively). Footballers also reported greater numbers of sexual partners over the last year than non-footballers although this did not reach statistical significance ($p=0.0814$) and there was no evidence of more partners when looking over the last three months ($p=0.9899$).

Condom use was greatest in men under 25 years with 34.7% reporting using condoms every time they had sex in the last three months in comparison to less than one-quarter of men aged 25 and older ($p<0.001$). Condom use did not vary by whether or not men played football.

Among men who had had sex, 3.8% reported that the gender of their last sexual partner was male and this did not vary significantly by age group. Footballers were less likely to report sex with another man (1.3% versus 4.8%) although, again, this was not statistically significant (p=0.350).

Table 2: Key sexual risk behaviours among men aged 18 to 35 years

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
Denominator (unweighted, weighted)	**411, 632**	**130, 246**	**124, 178**	157, 208		134, 206	277, 426	
Behavioural factors:								
Number of partners in the last year					<0.0001			0.0814
0	13.8%, 87	17.8%, 43	13.8%, 25	8.2%, 17		10.1%, 21	16.0%, 68	
	(10.1-18.7)	(11.1-27.4)	(7.8-23.2)	(4.5-14.6)		(5.3-18.4)	(11.1-22.5)	
1	61.4%, 388	43.5%, 107	66.2%, 118	81.8%, 170		59.1%, 122	62.7%, 267	
	(55.8-66.6)	(34.6-52.9)	(56.2-74.9)	(73.7-87.8)		(49.7-67.8)	(55.5-69.3)	
2	8.9%, 55	14.0%, 34	6.0%, 11	4.5%, 9		8.5%, 17	9.1%, 39	
	(6.2-12.5)	(8.8-21.5)	(2.8-12.6)	(2.3-8.6)		(4.5-15.4)	(5.9-13.8)	
3-4	8.0%, 50	10.3%, 25	9.3%, 16	3.3%, 7		13.5%, 28	4.8%, 20	
	(5.3-11.9)	(5.6-18.4)	(4.7-17.8)	(1.4-7.6)		(7.9-22.4)	(2.6-8.8)	
5+	8.0%, 50	14.3%, 35	4.8%, 8	2.2%, 5		8.8%, 18	7.5%, 32	
	(5.3-11.9)	(8.7-22.7)	(2.4-9.2)	(0.5-9.4)		(4.6-16.1)	(4.4-12.4)	

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men	18-24 years	25-29 years	30-35 years	*p*-value	Footballers	Non-Footballers	*p*-value
	%, N (95% CI)	%, N (95% CI)	%, N (95% CI)	%, N (95% CI)		%, N (95% CI)	%, N (95% CI)	
Number of partners in the last 3 months					0.0036			0.9899
0	26.6%, 168 (21.4-32.6)	34.4%, 85 (25.3-44.9)	26.7%, 48 (18.1-37.4)	15.4%, 32 (10.1-23.0)		25.7%, 53 (17.4-36.2)	27.1%, 116 (20.9-34.5)	
1	65.4%, 414 (59.3-70.9)	52.7%, 129 (42.5-62.6)	66.9%, 119 (55.8-76.4)	81.7%, 170 (73.6-87.7)		66.2%, 136 (55.7-75.3)	64.9%, 276 (57.7-71.4)	
2	2.9%, 18 (1.6-5.3)	3.7%, 9 (1.5-8.4)	3.9%, 7 (1.5-9.7)	0.9%, 2 (0.2-3.7)		2.8%, 6 (1.0-8.0)	3.0%, 13 (1.4-6.1)	
3-4	3.4%, 21 (1.8-6.3)	5.9%, 15 (2.8-11.9)	1.3%, 2 (0.2-8.7)	2.0%, 4 (0.4-9.3)		3.1%, 6 (1.1-8.3)	3.5%, 15 (1.6-7.7)	
5+	1.8%, 11 (0.7-4.5)	3.4%, 8 (1.1-10.0)	1.2%, 2 (0.3-5.0)	0%, 0		2.2%, 5 (0.5-8.4)	1.5%, 6 (0.4-5.4)	
Gender of last sexual partner					0.0522			0.350
Male	3.5%, 22 (2.0-6.0)	4.1%, 10 (1.7-9.5)	4.6%, 8 (2.0-10.6)	1.6%, 3 (0.5-5.3)		1.3%, 3 (0.3-6.3)	4.8%, 20 (2.7-8.6)	
Female	90.5%, 572 (86.1-93.6)	85.9%, 211 (77.2-91.7)	90.2%, 161 (81.2-95.1)	97.2%, 203 (93.6-98.8)		92.7%, 191 (84.3-96.8)	89.4%, 381 (83.4-93.1)	

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
Never had sex	6.0%, 38 (3.5-10.1)	10.0%, 25 (5.1-18.5)	5.2%, 9 (1.7-15.0)	1.2%, 2 (0.4-3.7)		6.0%, 12 (2.4-14.5)	6.0%, 25 (3.1-11.3)	
Condom use in last 3 months					0.0001			0.8757
Every time	26.9%, 170 (21.3-33.4)	34.7%, 85 (24.5-46.6)	22.6%, 40 (14.7-33.0)	22.0%, 46 (14.4-32.1)		27.7%, 57 (18.9-38.7)	26.4%, 112 (19.6-34.5)	
Sometimes	24.7%, 156 (19.4-31.0)	36.9%, 91 (26.4-48.9)	19.5%, 35 (12.0-30.1)	15.8%, 33 (9.5-25.3)		26.1%, 54 (17.6-36.8)	23.9%, 102 (17.7-31.6)	
Not at all	48.4%, 306 (41.8-55.0)	28.4%, 70 (18.7-40.5)	58.0%,103 (46.7-68.4)	62.2%, 129 (51.6-71.7)		46.2%, 95 (35.1-57.6)	49.7%, 212 (41.8-57.6)	

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Willingness to use self-collected testing kits for STIs (urine) and HIV (oral fluid) and acceptability of different settings

The majority of men were willing to provide a self-collected sample for STI/ HIV testing (Table 3). Specifically, 85.1% of all men reported that they were willing to provide a urine sample for STI testing with no variation by age group, while 86.9% reported their willingness to provide an oral fluid sample for HIV testing, although this did vary by age group from 79.7% of men aged 25-29 years to 95.0% of men aged 18-24 years (p=0.001). Willingness was also high among men who played football although not significantly different to those who did not play.

General practice surgeries (79.7%), sexual health clinics (66.8%) and pharmacies (65.4%) were the most acceptable test kit pick-up points with no variation by age. This was echoed among men who played football although these men were statistically more likely to find college and university campuses (p=0.0024) and youth clubs (p=0.0013) acceptable pick-up venues than non-footballers.

Among all men, further education settings were more popular than school settings as pick-up points (41.6% *vs.* 28.1%), probably because participants would no longer be in school settings, while the workplace was acceptable to 22.4% of men. Gym and sports centres were considered acceptable pick-up points by 18.5% and 13.4%, respectively, of all men, with no variation by age or football playing status. Postal test kits were acceptable to 52.2% of all men, again with no significant variation between any group.

Table 3: Willingness to use self-collected STI and HIV testing kits and acceptable pick-up points for tests among men aged 18 to 35 years

Factors	All men	18-24 years	25-29 years	30-35 years	*p*-value	Footballers	Non-Footballers	*p*-value
	%, N (95% CI)	%, N (95% CI)	%, N (95% CI)	%, N (95% CI)		%, N (95% CI)	%, N (95% CI)	
Denominator (unweighted, weighted)	411, 632	**130, 246**	**124, 178**	157, 208		134, 206	277, 426	
Willingness to use novel methods for testing:								
Willing to provide urine sample for STI testing	85.1%, 538 (80.1-88.8)	88.7%, 218 (81.0-93.5)	82.1%, 146 (71.2-89.5)	83.1%, 173 (75.2-88.9)	0.3687	88.6%, 183 (80.8-93.4)	83.1%, 354 (76.9-87.9)	0.2244
Willing to provide mouth swab for HIV testing	86.9%, 549 (82.4-90.4)	95.0%, 234 (89.7-97.6)	79.7%, 142 (69.9-87.0)	82.7%, 172 (74.2-88.9)	0.001	90.2%, 186 (82.2-94.8)	85.1%, 363 (79.1-89.5)	0.2320
Acceptable pick up points for testing kits								
General Practice surgery	79.7%, 504 (74.5-84.2)	79.3%, 195 (70.0-86.3)	76.4%, 136 (66.1-84.3)	83.7%, 174 (74.7-90.0)	0.5195	78.2%, 161 (69.1-85.2)	80.6%, 343 (74.2-85.8)	0.6167
GUM clinic	66.8%, 422 (60.8-72.3)	68.2%, 168 (58.4-76.6)	62.8%,112 (52.3-72.3)	68.7%, 143 (58.5-77.3)	0.6563	65.6%, 135 (55.7-74.3)	67.5%, 288 (60.0-74.2)	0.7518
Pharmacy	65.4%, 413 (59.4-71.0)	64.4%, 158 (54.3-73.4)	57.9%, 103 (46.9-68.2)	74.4%, 155 (64.2-82.5)	0.0947	63.5%, 131 (53.4-72.5)	66.6%, 284 (59.0-73.4)	0.6108

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
Sent in the post	52.2%, 330	53.5%, 132	51.4%, 91	51.1%, 106	0.9271	55.9%, 115	50.1%, 213	0.3699
	(46.4-58.0)	(43.4-63.3)	(40.9-61.9)	(41.5-60.6)		(46.2-65.1)	(42.5-57.7)	
College/ University campus	41.6%, 263	47.4%, 117	34.2%, 61	40.3%, 84	0.1540	54.1%, 111	34.4%, 147	0.0024
	(35.9-47.6)	(38.1-56.9)	(24.7-45.1)	(31.2-50.1)		(43.9-63.9)	(27.7-41.7)	
School	28.1%, 178	25.8%, 63	29.2%, 52	30.5%, 63	0.7435	34.4%, 71	24.4%, 104	0.0834
	(23.0-33.8)	(18.0-35.4)	(20.2-40.3)	(22.1-40.4)		(25.6-44.5)	(18.6-31.3)	
Workplace	22.4%, 142	16.2%, 40	24.0%, 43	30.1%, 63	0.0636	26.0%, 54	20.2%, 86	0.2693
	(17.8-27.8)	(10.0-25.2)	(16.3-33.9)	(21.6-40.2)		(18.0-36.0)	(15.1-26.6)	
Youth club	20.8%, 131	23.4%, 58	15.9%, 28	21.9%, 46	0.4056	31.3%, 64	14.7%, 63	0.0013
	(16.3-26.2)	(16.1-32.7)	(9.6-25.1)	(14.6-31.4)		(22.7-41.4)	(10.2-20.7)	
Gym	18.5%, 117	13.9%, 34	20.0%, 36	24.1%, 50	0.1673	23.2%, 48	15.9%, 68	0.1368
	(14.5-23.4)	(8.2-22.6)	(13.1-29.3)	(16.9-33.0)		(15.8-32.7)	(11.4-21.7)	
Bar/ pub/ nightclub	17.3%, 109	16.1%, 40	14.9%, 27	21.5%, 45	0.4711	18.8%, 39	16.5%, 70	0.6263
	(13.3-22.3)	(10.0-24.9)	(9.1-23.5)	(14.3-30.9)		(12.2-27.8)	(11.7-22.7)	
Recreational/ leisure/ sport	13.4%, 85	9.1%, 22	15.5%, 28	17.9%, 37	0.1485	16.3%, 34	11.7%, 50	0.2436
centre/ swimming pool	(9.9-17.9)	(4.8-16.5)	(9.4-24.4)	(11.4-27.0)		(10.4-24.7)	(7.9-17.0)	
Sports club	11.7%, 74	8.0%, 20	13.4%, 24	15.5%, 32	0.2186	11.9%, 25	11.5%, 49	0.9298
	(8.4-16.1)	(3.9-15.7)	(8.0-21.7)	(9.3-24.2)		(6.7-20.3)	97.7-16.9)	

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men	18-24 years	25-29 years	30-35 years	*p*-value	Footballers	Non-Footballers	*p*-value
	%, N (95% CI)	%, N (95% CI)	%, N (95% CI)	%, N (95% CI)		%, N (95% CI)	%, N (95% CI)	
Coffee shop/ café	6.9%, 43	2.6%, 6	9.8%, 17	10.6%, 22	0.0309	7.4%, 15	6.6%, 28	0.7778
	(4.6-10.3)	(0.9-7.4)	(5.2-17.7)	(5.8-18.7)		(3.8-14.0)	(3.9-10.9)	
Other	0.4%, 3	1.0%, 2	0.0%, 0	0.0%, 0	0.4700	0.0%, 0	0.7%, 3	0.4438
	(0.0-3.0)	(0.1-6.7)					(0.0-4.6)	

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Participation in sport

Of all men, 69.4% (95% CI 63.9% to 74.5%) had participated in a sporting activity at least once within the four weeks prior to interview with this proportion greatest among men over 30 (78.3%; 95% CI 69.7% to 84.9%) *vs.* 65.9% (95% CI 59.0% to 72.2%) among men aged 18-29 years, p=0.0189) (Table 4). Among all men aged 18-35 years, the five most popular activities to participate in were football (soccer) (52.9%; 95% CI 46.2% to 59.5%), jogging (45.4%; 95% CI 38.7% to 52.2%), gym (36.8%; 95% CI 30.3% to 43.8%), cycling (31.9%; 95% CI 26.0% to 38.6%) and swimming (29.6%; 95% CI 23.9% to 35.9%). Men under 30 years were more likely to have participated in football than men aged at least 30 (57.5%; 95% CI 49.2% to 65.4%) *vs.* 43.3% (95% CI 33.1% to 54.0%; p=0.033), with 74.4% (95% CI 65.2% to 81.8%) of men who played football reporting to play at least once a week (no variation by age group). 74.4% of men who had played football in the last month did so at least once a week.

As reported above, there was generally low acceptability of sports settings as pick-up points for STI and HIV testing kits but, among those who did report participation in a sporting activity within the last four weeks, 48.3% (95% CI 42.4% to 54.1%) and 46.9% (95% CI 41.3% to 52.6%) said they would be willing to pick-up STI and HIV testing kits from the place of activity, respectively, with no significant variation by age group. Among the 129 men who reported playing football in the last four weeks these figures were 47.3% (95% CI 37.2% to 57.6%) and 43.5% (95% CI 34.1% to 53.3%), respectively.

Men who played football were more physically active than men who did not although this did not seem to translate to healthier sexual behaviours in terms of rate of partner change and condom use.

Table 4: Participation in sport among men ages 18 to 35 years

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
Denominator (unweighted, weighted)	411, 632	130, 246	124, 178	157, 208		134, 206	277, 426	
Participation in sport:								
Taken part in sport/ physical activity in last 4 weeks	69.4%, 439 (63.9-74.5)	68.3%, 168 (58.7-76.6)	62.5%, 111 (52.1-71.8)	78.3%, 163 (69.7-84.9)	0.0637	100%, 206	51.7%, 220 (44.7-58.7)	<0.0001
Activities taken part in								
Football	52.9%, 334 (46.2-59.5)	59.2%, 146 (47.6-69.9)	55.0%, 98 (43.5-66.0)	43.3%, 90 (33.1-54.0)	0.1052	100%, 206	0%, 0	<0.0001
Jogging	45.4%, 287 (38.7-52.2)	43.6%, 107 (32.4-55.5)	42.0%, 75 (30.8-54.0)	50.4%, 105 (39.8-60.9)	0.5599	46.8%, 96 (37.0-56.8)	43.8%, 187 (34.4-53.6)	0.6816
Gym/ Health club	36.8%, 233 (30.3-43.8)	37.4%, 92 (26.5-49.7)	43.7%, 78 (31.6-56.5)	30.2%, 63 (21.2-41.0)	0.2964	32.0%, 66 (23.4-42.0)	42.1%, 179 (32.9-51.9)	0.1355
Cycling	31.9%, 202 (26.0-38.6)	35.3%, 87 (25.1-47.0)	20.8%, 37 (13.0-31.6)	37.1%, 77 (27.2-48.2)	0.0878	34.6%, 71 (26.5-43.8)	28.9%, 123 (21.0-38.3)	0.3560
Swimming	29.6%, 187 (23.9-35.9)	30.8%, 76 (21.0-42.8)	34.6%, 62 (23.5-47.7)	23.9%, 50 (16.3-33.5)	0.4029	24.1%, 50 (17.1-32.8)	35.8%, 153 (27.5-45.0)	0.0519

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors		All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
	Martial Arts	7.7%, 49 (4.5-12.7)	13.2%, 32 (6.8-24.1)	2.8%, 5 (0.7-10.6)	5.0%, 10 (4.5-12.7)	0.0386	4.4%, 9 (1.6-11.7)	11.3%, 48 (6.1-20.1)	0.0999
	Athletics	6.6%, 42 (3.9-11.1)	9.8%, 24 (4.7-19.3)	5.3%, 9 (2.0-13.8)	3.8%, 8 (1.5-9.2)	0.2070	7.8%, 16 (4.2-14.3)	5.3%, 23 (2.1-12.8)	0.4770
	Badminton	6.0%, 38 (3.5-10.3)	8.6%, 21 (3.8-18.4)	5.6%, 10 (2.1-13.8)	3.3%, 7 (1.2-8.8)	0.3110	7.4%, 15 (3.6-14.7)	4.5%, 19 (1.9-10.2)	0.3640
	Cricket	5.9%, 37 (3.1-11.2)	11.2%, 28 (5.5-21.6)	5.2%, 9 (1.1-21.1)	0%, 0	0.0572	6.6%, 14 (2.7-15.4)	5.2%, 22 (1.9-13.2)	0.7112
	Boxing	5.5%, 35 (3.2-9.3)	5.4%, 13 (2.0-13.8)	7.8%, 14 (3.5-16.7)	3.7%, 8 (12.7-10.1)	0.5539	6.4%, 14 (3.1-12.6)	4.5%, 19 (1.9-10.3)	0.5484
	Tennis	5.3%, 33 (2.7-10.1)	4.7%, 12 (1.5-13.3)	6.9%, 12 (2.0-21.1)	4.7%, 10 (1.6-13.5)	0.8488	8.5%, 18 (4.0-17.1)	1.7%, 7 (0.5-5.8)	0.0154
	Basketball	3.2%, 20 (1.5-6.5))	6.2%, 15 (2.6-13.8))	0%, 0	2.1%, 4 (0.5-8.1)	0.0701	4.9%, 10 (2.2-10.9)	1.2%, 5 (0.3-4.9)	0.0685
	Rowing	2.5%, 16 (1.0-5.9)	3.0%, 7 (0.6-12.9)	2.6%, 5 (0.8-8.4)	1.7%, 3 (0.4-7.2)	0.8304	2.9%, 6 (0.8-10.0)	2.0%, 9 (0.7-5.5)	0.6224

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
Rugby union	1.7%, 11 (0.7-4.1)	0.9%, 2 (0.1-6.5)	1.9%, 3 (0.4-7.9)	2.5%, 5 (0.6-9.4)	0.6912	2.9%, 6 (1.1-7.6)	0.4%, 2 (0.0-2.6)	0.0311
Rugby league	1.8%, 11 (0.7-4.6)	3.5%, 9 (1.1-10.3)	1.3%, 2 (0.2-8.5)	0%, 0	0.1916	1.5%, 3 (0.4-6.1)	2.0%, 9 (0.5-7.8)	0.7974
Hockey (field)	1.6%, 10 (0.4-5.7)	3.5%, 9 (0.8-13.6)	0.6%, 1 (0.0-4.5)	0%, 0	0.1793	2.7%, 6 (0.6-10.5)	0.4%, 2 (0.0-2.6)	0.0615
Other	12.6%, 80 (8.7-17.7)	13.5%, 33 (7.3-23.5)	12.4%, 22 (6.3-22.9)	11.6%, 24 (6.6-19.7)	0.9327	5.4%, 11 (2.3-12.5)	20.6%, 88 (14.1-29.0)	0.0019
Frequency of that activity in the last 4 weeks								
Football					0.3408			
Every day	4.5%, 28 (1.8-10.6)	8.1%, 20 (2.9-20.5)	0%, 0	3.1%, 6 (0.4-19.6)		4.5%, 9 (1.8-10.6)		
Not every day but >once a week	31.1%, 197 (22.8-40.7)	32.4%, 80 (20.3-47.5)	40.1%, 71 (24.4-58.2)	19.3%, 40 (9.3-35.8)		31.1%, 64 (22.8-40.7)		
Once a week	38.9%, 246 (29.9-48.6)	34.9%, 86 (21.7-50.8)	41.0%, 73 (26.0-57.8)	43.4%, 90 (28.2-59.9)		38.9%, 80 (29.9-48.6)		

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Factors	All men %, N (95% CI)	18-24 years %, N (95% CI)	25-29 years %, N (95% CI)	30-35 years %, N (95% CI)	*p*-value	Footballers %, N (95% CI)	Non-Footballers %, N (95% CI)	*p*-value
Less than once a week but >once a month	14.3%, 90 (8.8-22.4)	16.4%, 40 (7.6-31.8)	6.2%, 11 (1.9-18.4)	19.3%, 40 (9.3-35.7)		14.3%, 29 (8.8-22.4)		
Once a month	11.3%, 71 (6.5-18.9)	8.3%, 20 (3.3-19.7)	12.7%, 23 (5.0-28.6)	14.9%, 31 (6.5-30.7)		11.3%, 23 (6.5-18.9)		
Acceptable to pick up urine test at place of activity	48.3%, 305 (42.4-54.1)	48.3%, 119 (38.6-58.2)	40.2%, 72 (31.1-50.1)	56.4%, 117 (46.8-65.6)	0.0884	47.3%, 97 (37.2-57.5)	48.8%, 208 (41.8-55.9)	0.8014
Acceptable to pick up mouth swab from that place	46.9%, 296 (41.3-52.6)	47.3%, 116 (38.0-56.7)	43.1%, 77 (33.8-53.0)	50.3%, 105 (40.8-59.9)	0.6079	43.5%, 90 (34.2-53.2)	48.9%, 208 (41.8-56.1)	0.3827

percentages presented for weighted sample, p-values for difference between age groups and footballers versus non-footballers

Discussion

The aims of the stratified random probability sample survey were to explore in which venues men aged 18 to 35 would find it acceptable to access self taken testing kits for Chlamydia and HIV and whether or not men who play football find the venues in which they play football acceptable pick-up points for self-testing kits.

Overall, men participating in this survey appeared to be well engaged with health care. Almost all men were registered with a GP and three quarters had seen their GP in the last year. Awareness of sexual health appeared to be high as almost a third of men had been screened for STIs and a fifth had been tested for HIV. Willingness to use self-collected testing kits for STIs and HIV are highly acceptable among men. The most acceptable venues for young men to pick up self-collected STI and HIV test kits were healthcare settings (general practice, sexual health clinics, pharmacies) whereas sport, social and recreational venues were acceptable to a smaller proportion of men. Football was the most popular sport and around half of men who played football would find the venue in which they play an acceptable place to access STI and HIV testing kits.

The main findings from the study are:

1) The majority of men have been to their GP in the last year

Although this finding is not new it has been met with surprise when presenting this data at meetings to clinicians and researchers. There continues to be a

strongly held belief that men are difficult to reach and do not attend traditional healthcare settings. As a result, attempts to increase chlamydia screening uptake in men has often focussed on trying to create "A range of innovative, culturally appropriate and co-ordinated approaches…" when, I would argue that, providing basic sexual health services could be more efficiently placed within existing frameworks however 'non-innovative' they may seem [p.115, Serrant-Green and Mcliskey 2008]. This is especially true when considering this first point in conjunction with points 4 and 5 below.

2) Around a third of men have tested for STIs in the past with another fifth previously testing for HIV

Men are already engaging with testing for STIs and HIV. This finding helps to show that men are not inherently against testing and together with point 3 suggest that more men would test if they felt they had easy access to tests.

Younger men were more likely to have tested in the recent past, probably a reflection of their more rapid partner change and risk perception. However, condom use was highest among younger men, again, probably as a result of not being in long-term, single partner relationships. Men who play football did not have significantly different health seeking behaviours to men who do not play football. The assumption that men who engage in sporting activities would more actively pursue other health behaviours does not seem to be supported by these data. This is important when considering the applications of these findings for an empirical pilot study offering Chlamydia testing in football clubs. Men who play

football are the same as other men when it comes to previous testing behaviour and willingness to use self-taken testing kits (see point 3).

3) Self collected urine tests for STIs and saliva tests for HIV are highly acceptable to men

There is high reported willingness to use self-collected testing kits for HIV and STIs among men. These testing kits are already widely used in clinical and non-clinical settings and this study supports their continued use. They allow for rapid specimen collection, without the presence of trained (and expensive) healthcare professionals. These testing kits also afford an enhanced degree of privacy for the user; they can be collected in private and sent back to laboratories by post. This speed and convenience of use may be important in encouraging more men to test for infections.

4) Traditional healthcare settings are the most acceptable venues in which to access STI and HIV tests

Although these self-taken testing kits are highly acceptable and can be supplied in a number of settings, men did not find all settings as acceptable as each other. Healthcare settings were the most popular settings in which to access testing kits. Part of this may reflect traditional attitudes towards access and supply of healthcare. It may also be the case that there is a degree of perceived congruency between healthcare settings and medical testing which makes these the preferred venues for access. This is in keeping with findings from the qualitative interviews (see section below).

Although non-traditional settings were acceptable to a minority of men, and these men may not access testing in any other setting, it seems that current infrastructures in healthcare venues are underused. Further work would need to be done to understand how best to use these settings to allow access to testing kits, in a similar way to the work I have done with footballers in the interviews (see point 6).

5) General practice is the most acceptable setting to access STI and HIV testing kits

Creating new settings for testing seems unnecessary when existing venues that men frequently attend already exist. It is even more unnecessary when these existing settings are the most acceptable venues in which to access testing. The largest problem to providing more extensive chlamydia screening in general practice seems to be overcoming the reluctance of those working in general practice to offer testing. Whether or not this is due to lack of knowledge, time, embarrassment or money, none of these barriers are insurmountable and redirecting money that is channeled into NCSP initiatives to test more men may well be used more efficiently in primary care.

Piloting self-collected STI testing kits in general practice would be a reasonable approach to take. Testing and developing different pathways of access to testing kits in general practice, akin to the football club pilot, would allow a deeper understanding of how to best use general practice settings. Interviews or focus

group discussions with key holders could be done after the pilot intervention to explore barriers and potential ways to embed testing in general practice.

The NCSP has moved towards this model of screening, embedding itself within general practice. Studies are already exist to show that improving GP confidence in the delivery of Chlamydia screening can increase testing rates in general practice. (McNulty, Hogan et al. STI)

6) Non-traditional settings, including sport settings, are acceptable to a minority of men and, for sport venues, this acceptability increases if they frequent those venues.

Using non-traditional settings may help to reach some men who would not be reached through traditional settings. However, the acceptability of these venues is significantly lower than for healthcare settings. Even among those who are frequently in sport settings the acceptability is still much lower than for traditional settings. This being said, the research that I conducted with amateur footballers is worthwhile as previous screening programmes in non-traditional settings have rarely formally explored acceptability. Instead they have relied on testing rates as a surrogate to show that the approach was acceptable and feasible. This misses the opportunity to more fully understand the reasons why. A discussion combining the findings of the omnibus and the interviews can be found in a section later in this chapter.

Strengths and weaknesses

To my knowledge this is the first stratified random probability survey of young men in Great Britain to determine the acceptability of various settings for accessing self-collected STI and HIV test kits. There are many strengths to this study which allow it to provide generalisable data. Using a stratified random probability sample survey method and appropriate calibration and selection weighting means that the results should be generalisable to all men between 18 and 35 years in Great Britain. Because of this, the results should be of benefit to those involved in researching, developing and delivering STI services for men in traditional and non-healthcare settings within Great Britain, particularly in the context of low uptake of testing in men reported by the National Chlamydia Screening Programme.

Critics may suggest that social desirability bias may influence the findings. Social desirability bias means that participants may feel a pressure to report certain behaviours even if they do not accurately reflect their actual behaviour. The use of CASI and CAPI in this study help to overcome this bias as participants feel confident that their answers will be confidential. Specifically, we used CASI for more sensitive questions about sexual behaviours.

There are some weaknesses to the study. The reasons for refusal to take part in the survey, or how those who declined differ from participants are not known. There may exist some important differences between those who took part and those who

declined. However, several techniques were used in an attempt to ensure that those who were invited to take part could do so. An unconditional voucher for £5 was sent with the invitations. This has been shown to increase participation. Multiple attempts were made to contact participants before they were recorded as a non-participant. Importantly, these attempts at contact took place at varying times of day and the week so that those in full time employment could take part. The use of calibration weighting attempts to adjust for a lower response rate among certain groups of men. Differences in acceptability between ethnic groups and whether respondents live in urban or rural areas are unknown as the sample was not powered to look for these associations. The questions developed did not undergo formal psychometric testing, however, where possible questions that had been validated for use in the highly regarded Natsal surveys where used.

Comparison with other studies

The finding that most men had seen their GP in the last year is in keeping with other studies (Briscoe 1987;Macintyre, Hunt *et al.* 1996;Mustard, Kaufert *et al.* 1998;Fernandez, Schiaffino *et al.* 1999;Salisbury, Macleod *et al.* 2006) and taken together with the high acceptability of general practice for accessing STI and HIV testing kits highlights the importance of, and potential for, Chlamydia and HIV screening in general practice, especially among younger men (Johnson, Simms *et al.* 2010). However, current rates of STI and HIV screening in general practice are low, which could suggest reluctance on the part of the health care provider to offer testing (Sadler, Low *et al.* 2010). Many barriers exist to both opportunistic chlamydia screening and HIV testing in general practice (Gott, Galena *et al.*

2004;McNulty, Freeman *et al.* 2004;Hocking, Parker *et al.* 2008;McNulty, Freeman *et al.* 2010).

A substantial proportion of men in this study had previously tested for STIs (28.7%) and HIV (19.8%) mostly within specialist sexual health settings. Among 18 to 24 year olds over one quarter reported that they had previously been tested for STIs. It is not possible to compare this to NCSP data as they report tests within the last year (around 12% of 16 to 24 year olds) (National Chlamydia Screening Programme 2011). The reasons for seeking a previous test are not known and may reflect that men had symptoms at that time.

These data reveal a testing rate for HIV which is higher than equivalent data from the 2001 Natsal, which found that 6.63% (95% CI 5.14% to 8.52%) of men aged 16-24 years and 14.8% (95% CI 13.0% to 16.7%) of men aged 25-34 years reported having had a blood test for HIV (McGarrigle, Mercer *et al.* 2005). Both the data in this study and the Natsal2 data excluded blood donation as a reason for an HIV test. In the most recent Natsal3 survey these percentages are higher with 14% (95%CI 12.0% to 16.2%) of men aged 16-24 years and 24.3% (95% CI 21.7% to 27.1%) of men aged 25-34 years reporting testing for HIV in the past five years (Sonnenberg, Clifton *et al.* 2013).

Whilst many studies have shown that using non-traditional and sport settings to screen for STIs is feasible, (Ford, Viadro *et al.* 2004;Kong, Hocking *et al.* 2009) few have focussed on the acceptability of different settings for men. Lorimer's study of willingness to participate in a non-medical approach to chlamydia

screening found that men in particular valued the possibility of screening in these settings (Lorimer, Reid *et al.* 2009). Furthermore, the uptake of screening varied by setting, supporting our finding that acceptability of sport settings was greater in those who had actually engaged in sporting activities over the last month (Lorimer, Reid *et al.* 2009). Anonymity appeared to be a key factor determining acceptability of screening in a qualitative study of young men's experiences and perceptions of chlamydia screening commissioned by the NCSP (Forrest and Lloyd 2011). Men in that study rejected many of the proposed sport and social venues for fear of the stigma of being seen to take a test. Men also appeared to perceive a degree of incongruity between attending these locations for recreation and the health message of screening (Forrest and Lloyd 2011).

Policy context

A move towards opt-out chlamydia testing in general practice could potentially lead to a significant rise in the numbers of tests performed as seen with opt-out HIV testing in general practice and other settings (Heijman, Stolte *et al.* 2009;Madge, Smith *et al.* 2011). However, the cost-effectiveness of this approach would need to be examined as prioritising chlamydia screening in general practice may require financial incentives through Quality and Outcomes Framework targets (National Health Service 2013). Further work to overcome the many barriers to screening in general practice will also need to be performed.

The use of self-collected urine testing kits would only be appropriate for asymptomatic men and would also miss infections at non-genital sites. This may

be particularly important for men who have sex with men, although self-collected rectal and pharyngeal swabs perform as well as provider-taken swabs and seem to be acceptable (Alexander, Ison *et al.* 2008;van der Helm, Hoebe *et al.* 2009;Wayal, Llewellyn *et al.* 2009). However, their use in general practice has not been evaluated to my knowledge. Self-collected specimens for syphilis testing is feasible using dried blood from a finger prick and appears to be acceptable among men who have sex with men recruited from non-clinical settings in one study (Brown, Klapper *et al.* 2009;Lee, Fairley *et al.* 2010).

It is important that venues in which STI screening and testing kits are offered are acceptable to target populations. Whilst it is now possible to deliver testing in non-clinical settings, this research highlights that, among 18 to 35 year old men in Great Britain at least, it is the traditional healthcare settings that are most acceptable as pick-up points for self-testing kits. Young men frequently access primary care and there is considerable potential to engage more men in STI and HIV testing through general practice (Hughes, Williams *et al.* 2007). The NCSP data shows that only 25% of tests in men are done in "core" health settings (National Chlamydia Screening Programme 2011). In contrast, this research shows that these are the preferred access points for as many as 80% of men. Based on these findings, there is clearly a mismatch between where services are currently provided and the settings in which men prefer to access STI and HIV screening. While non-traditional settings are acceptable to a minority of men, and may be important in reaching men who would otherwise not seek STI screening, given the high levels of acceptability of traditional services, further research into outreach screening must include appropriate analysis of cost effectiveness and

public health impact so that resources are used most appropriately. This is especially important when considering the potentially low rates of chlamydia detected among the men screening in non-healthcare settings (Johnson, Simms *et al.* 2010). While sports and other non-healthcare settings are acceptable pick up points for some men, more research is needed to understand how these venues could be used most effectively for public health.

Future work

Future work should focus on better understanding why men are not opportunistically offered tests at times when they engage with health care for other reasons. This is the norm for female screening and should be encouraged in male screening too. It would mean that significantly greater numbers of men would have the potential to screen without going out of their way to find testing kits and would appear to be highly acceptable. Considerable resources are used to try and engage men in screening in novel venues, effectively attempting to create new opportunities without fully utilising existing ones. Embedding chlamydia screening in existing healthcare services may prove to be a much more cost effective and sustainable model with the bonus of being the most acceptable method to patients.

Summary

I have shown, in this national survey of men aged 18 to 35 years, that men are willing to test for STIs, find the use of self-taken samples for Chlamydia testing acceptable and find health care settings the most acceptable venues in which to

access test kits. A minority of men find sport settings acceptable venues, however, this proportion is greater among men who regularly attend those settings.

The survey cannot tell us why men find one setting more acceptable than any other, or in which circumstance they would prefer one venue over another. This context is better understood using qualitative methods. Therefore, in the following chapters (5 and 6) I present the findings from interviews with young men who play football. In Chapter 5 I will move away from the impersonal, national survey, and explain the social context in which the men I interviewed live and play football. In Chapter 6 I will then explain the issues which are important to men when considering testing in football settings.

CHAPTER 5: THE SOCIAL CONTEXT IN WHICH YOUNG MEN PLAY FOOTBALL

Introduction

In the previous chapter (Chapter 4) I have shown that, across Great Britain, men frequently access primary care and a significant proportion have tested for HIV and STIs. This suggests that men are willing to engage with general and sexual health and Chlamydia testing. Self collected samples are acceptable and men who play football are willing to access these test kits in their football clubs. The best way to provide and promote testing in football clubs is not known and warrants further investigation as providing testing in those settings may encourage testing for men who would not access other venues. The use of qualitative interviews to explore the acceptability of testing in football clubs prior to an empirical pilot trial allows us to better understand reasons behind use and non-use of proposed testing models. Therefore, I have conducted interviews with men who play amateur football to explore attitudes to Chlamydia testing in football clubs (see Chapter 3 for methodology).

In this chapter, I present the social context in which the young men I interviewed place themselves. It is intended to provide an overview, and foundation, for understanding the chapter which follows about practical considerations when providing testing in football clubs (Chapter 6). Throughout the interviews, men talked about the reasons they play football, the relationships they have with other men in the teams and their attitudes to health, general and sexual, and women.

Understanding the reasons why men place themselves in football settings helps us to understanding their attitudes to providing Chlamydia testing in football clubs.

Why do these men play football?

Whilst it was not a specific aim of the interviews to explore why men play football, it was a question which I asked all participants. All the participants of the interviews belonged to football clubs and play in teams competing in amateur leagues. Engagement with the clubs varied between men. Some had formal roles of responsibility on club committees or on the teams whereas others only attended training and matches if selected to play. Motivations for their involvement with the clubs also varied. Understanding these motivations allows further interpretation of why men find certain testing pathway processes acceptable (or not) and are discussed in this section.

For the love of it

For many of the men, the primary and overriding reason for playing football is as simple as "I have always played, I just love football" [own words]. Playing football is just something that is an important and integral part of their lives; something that they had always done and draw enjoyment from doing. Football is literally part of some men's identity. It is part of their social and personal lives.

(J)ohn "And what are the reasons for playing football? Why are you involved?"

(P)articipant "I just really enjoy it as a game. It's something I've sort of grown up with. So in some ways it's hard to isolate what it is I enjoy because it is like so linked with my own personality now at times. I feel like it's just been a part of me literally since as long as I can remember, since I was 8."

Participant 014

From a young age these men had been involved in playing football in school, as part of organised sport and to form friendships with other boys. Football was something that boys just did but in doing it they learnt to perform acceptable gender roles. Boys wanted to be with other boys, and in being with other boys they were part of a homosocial group with common interests and common behaviours. Being part of this group not only allowed boys to learn how to be men through normative gender performance but it also afforded power by aligning oneself with the masculine hegemony. Taking part in competitive sport was part of this process of learning normative gender performance and seen as a distinct progression from more childish and unstructured games.

J "…Can you remember why you first became involved in football?"

P "I can. Because a friend of mine – he wasn't a friend at the time. He just came to my school in Year 5 [age 9 to 10 years]*, when I was playing running games. This guy came in and started playing football, and I thought, what's this guy doing, where's he going playing football.*

So I thought, I can do that too. So then I picked it up. He was a very good friend of mine after that. It was because of that. It was probably a bit of competition and that sort of thing."

Participant 017

This desire to be with other men and to form new friendships with men continued to be a motivation for playing into later life. The 18 men who I interviewed were in a variety of life stages, both personally and professionally. The majority were not from London originally and had moved to the city for study and work opportunities. Few were in current relationships and all, with the exception of one man, self-identifying as heterosexual. Some were in relationships but only one man had a child. Because most of the men had moved to London, leaving family and friends in other parts of the UK and Europe, they were often in shared accommodation with other young men and trying to develop new friendship networks. This was often the catalyst for joining their respective football clubs - someone they lived with, or who was part of their new work or study environment, was already involved in the club and suggested that they should join. In this way men continued to seek homosocial groups - other men with common interests.

*J "And you're living here with J***, who is another player. Is it just the two of you?"*

*P "No, I'm living here with J*** and P***. ...He plays football, but not in our team."*

J "And how long have you been playing football with [name of football club]*?"*

P "Since I came to London, like five months ago."

J "And why did you become involved?"

*P "Well because J*** was part of the team already so he kind of invited me to do some training. And I love to play football, and I wanted to do some exercise to keep me fit. So I went there and I'm playing with them now."*

J "Is that your main reason for playing – you said about exercise and enjoyment."

P "Pretty much the main three reasons are exercise, keeping fit, and also to get to know new people because I'm new in the city. So this helps me getting to know more people in a good environment…"

Participant 018

When probed more about what the men gained from playing football there were a range of responses. All men played primarily for enjoyment - they just love football. However, for many, this enjoyment stems from being with their friends and other men who enjoy the same things. Therefore, it is more than just enjoying the act of playing football. Instead, the wider social context is important. These men enjoy football because they are with other men who they perceive as similar to them. This is a crucial idea - men seek to be part of these homosocial groups in order to be the same as other men. The importance of this is that any situation that threatens to expose individual men as different to the group is deeply threatening. For example, offering Chlamydia testing to one individual rather than to the whole team would be unacceptable. Furthermore, anything which impinges on the

primary reason for being there in the first place, the enjoyment, would also be unpopular (see Chapter 6).

> *J "...What about kind of social aspects to being involved in a team?"*
>
> *P "...I think in any football club that is something that you really enjoy. Even just little things around the game itself, not necessarily going out afterwards, but just spending time with people who are in a similar situation with similar interests to you is always gonna be fun. So I greatly enjoy the social side of it."*
>
> ***Participant 014***

However, whilst this participant specifically enjoyed the social aspect of being part of the team, other men also extended this idea of enjoying the social aspect of playing football to situations away from the club and fellow team members and into non-football settings. Therefore, playing football enabled some men to form relationships with men in a variety of other settings. Furthermore, to demonstrate a deeper knowledge of the sport placed men in a position of power over others. As knowledge of sport is seen as a masculine characteristic it strengthens their normative gender performance, reinforcing their masculine identities to themselves and to others.

J "And can you explain why you play football?"

P "...I find it good in terms of not just meeting friends but also being able to speak to people that I don't know. Even at work, people will talk about – especially if there's a World Cup on – last summer people were talking about it, so it's quite good to think actually I know more than most people about this particular topic, which is quite nice."

Participant 015

This social aspect to playing was almost universally important for the men interviewed, although it was occasionally specifically rejected as a major motivation for playing. However, social aspects were seen as a welcome by-product of playing even if not a main reason for involvement. For participant 017, the primary enjoyment came from the competitive nature of playing football. This was shared with other men. Football allowed them to "win" against other men although it was recognised by most that at an amateur level the competition was very much secondary to the enjoyment felt at taking part. Once again, competing with oneself and others allows these men to engage in normative gender behaviours and contributes further to their masculine identities.

J "And other reasons – social aspects, making mates?"

P "That came with it, but that's never been my intention to play football. I play because I want to better myself, like improve my game, and just keep fit as well. But socialising comes with it, which is great, but that's never in my mind to play football to meet people."

Participant 017

To be healthy

Health benefits were another commonly cited reason for playing. Although this was secondary to the social and enjoyment aspects of playing football, it was a welcome effect of regular training and matches. Indeed, the pursuit of health in other settings, the gym for example, was seen as boring because of the lack of interaction with other men. Being with other men meant that men could engage with health seeking behaviours together as part of the group. Once again, within this homosocial group it is crucial to maintain similarities with other members.

> *J "Okay, and so your reasons for being involved in a football team, how would you summarise that?"*
>
> *P "I'd say probably 1) fitness, 2) enjoyment. So fitness in terms of I prefer doing that than running on a treadmill in the gym and secondly there's a social side of things, it's good to meet other people in the area. Socialise with like-minded people and, yeah, I really enjoy it."*
>
> ***Participant 006***

Health and fitness was not paramount for all men, some of whom preferred to pursue fitness in other ways. Instead, socialising and enjoyment remained the main motivation for playing. Therefore, keeping fit and playing for health reasons was seen as secondary to enjoyment - it was a happy consequence of playing but not an essential part of the reason for playing. However, as one participant suggested, the reasons for playing may change over time as men aged.

J "And so are there any kind of health reasons for being involved in football for you?"

P "No, not really. That's not the reason I play football. The reason I play is I enjoy it. Obviously there's a by-product to that almost, it keeps me fit but fitness isn't the reason I play. Maybe later on it might be but to be honest I don't think it actually will be a reason. And like I cycle to work and the reason I do that isn't so much for fitness it's 'cos I enjoy that and also it saves a lot of money on the travel cards, etc."

Participant 009

Men recognised that there exists a complex relationship between playing football, socialising with other men and fitness. In all clubs, socialising after a game or training was an important aspect of being part of the team. Again, this links to themes of taking part in the homosocial group and performance of masculinity. This frequently involved consuming large quantities of alcohol and unhealthy foods and "banter" about casual sexual relationships. The apparent dichotomy between healthy and unhealthy behaviours by encouraging health through exercise and conforming to social pressures to behave like one of the "lads" was clearly seen by the participants. However, being able to fulfil all of these roles was important and a test of masculinity - real men should be able to play a full match of football and also hold their drink.

P "...Any social club, and football is no better or worse than anyone else, promotes say a culture of drinking for a start. You know, you look at the social activities we do and the tours we do, it's all around getting

boozed up. …And football by its nature, apart from the goalkeeper, is exercise and fitness and that sort of stuff. So general fitness is promoted. If you get yourself to training at the start of the season it's all about if your fitness isn't there you're going to get dropped, because all throughout you'd rather have a worse player that can run for 90 minutes than a better player that's going to fade after 45. So fitness generally is encouraged. Diet – our post match hospitality is a big plate of chips and some deep fried sausage rolls and some sandwiches…"

Participant 004

Therefore, many behaviours which were encouraged through being part of the team were contradictory to being healthy and may reflect anti-health and risk behaviours to reinforce masculine identities. Men were expected to be fit enough to play football for 90 minutes but to also partake in group activities away from the pitch which were potentially damaging to health but helped to strengthen team relationships and reinforce normative masculine identities. This was not true for all men, however, and one participant was a personal trainer who felt that all aspects of his life should reflect healthy choices. However, achieving better than average strength and fitness, in the context of being a personal trainer, also easily feeds into ideals of hegemonic masculinity which idealises strength and athleticism. Therefore, although he specifically rejects certain masculine behaviours he offsets any harm to his masculinity by embracing others. Another participant played semi-professional football in the recent past and had been subject to rigorous fitness regimens and policing of health behaviours by his coach which continued to influence health choices around post match socialising.

P "I think within any setting it's extremely important to always promote health. I think these days it's not done at all. …within a sports environment I think it has to be implemented, because it makes such a difference. It makes such a difference. If you have a healthy player and a non-healthy player performance will be completely different…"

Participant 005

For other men, normally those in senior team positions, there was a need to balance poor health behaviours such as excessive alcohol consumption with being fit enough to play and lead a team. Therefore men have to navigate a variety of conflicting behaviours in order to project acceptable masculine identities to others.

Performing normative gender identities

Playing football allowed men to demonstrate normative gender performance not only through the very action of playing football but through the interactions with other men it afforded them. By choosing to be part of homosocial groups, men observed, practised and developed behaviours consistent with masculine ideals. In particular, men felt compelled to discuss sex and sexual health in a "*jokey*" way [*Participant 010*] when in front of each other. This approach allowed men to show a lack of concern about health, a feminine pursuit, whilst projecting an interest and prowess in sex, a desired masculine attribute.

P "I don't know. I think it's seen as quite a, I suppose with any sports, footballers, it's always sort of an ongoing joke about, you know, training, I hear about the 1st Team, about, oh yeah, who did what on a Saturday night and things like that. So it's always kind of quite a jokey thing and it's not seen as that serious in terms of going out and, you know, kind of having sex with different people. I don't think, yeah, people don't really take it seriously in that respect. Although they might do actually in the privacy of kind of their own setting. When they're at the football club people say, oh yeah, it's kind of, one-upmanship, lads being lads I suppose."

J "Okay, so sex is discussed in quite a jokey way is it?"

P "Definitely yeah. So for example at training last Wednesday a player shall we say, turned up and he was saying he'd got the all clear and, I'm kind of back in the game, and stuff like that. So that's kind of one example of how it's kind of approached. It's quite a jokey subject I suppose."

***Participant* 010**

This "jokey" attitude to sex extended to initial attitudes to the idea of offering Chlamydia testing in football clubs. Men felt that the surrounding banter about sex and STIs may detract from the intended seriousness of the message. However, interestingly, men were quick to distance themselves personally from these behaviours, instead talking about how these issues would not be problematic for themselves but for "other men". Few men could agree on what type of man would be most accepting of Chlamydia testing in football clubs, only that they

themselves would be fine with it. Older men felt that younger men would benefit most from the testing but also that they would be most embarrassed by it because they were less mature and had more sexual partners. Younger men felt that older men would not find it acceptable because they would be in relationships already. Single men felt that men in relationships would be offended whereas those in relationships said it would be fine. These "other men" were seen as less mature and by extension of this, probably younger and single. However, some younger men felt the opposite and that they were more used to talking about sex and sexual health than older men. By placing themselves in opposition to these less mature attitudes about sex, participants rejected one masculinity (joking about sex and not taking health seriously) in favour of projecting the outward appearance of maturity. In this way it was possible for men to create a hierarchy of desirable masculine traits, trading one off against another in order to maintain an acceptable gender performance.

> *P "...It's like sex, it's like when you're an eight-year-old, it's like, oh my God you can't talk about that! And they're still like that now. It's just hard but it's just always been like that. ...I mean like I'm, again, one of these people who would talk about anything and I'd be like, 'Oh f***ing hell lads, I had a bit of a scare last week, went for a test,' and 'What?' And then they're all like, 'Oh you had a test done, f***ing hell.' And you think, yeah, but it's life, it's just like it happens don't it?"*
>
> ***Participant* 012**

None of the men interviewed self-identified as these “other men”. All of them positioned their own attitudes to sex and sexual health in opposition to how these other men would behave. Whilst for some this was done to demonstrate that they were more mature than other men, for others it may be that they recognise that traditional behaviours associated with hegemonic masculinity may not be ideal behaviours and attitudes to embody in their social groups. So whilst all men felt it would be OK for them to be offered a test and would not draw offence from the process, there is a clear and powerful underlying process of assumption taking place about who will and who will not find testing acceptable. This process may well have an impact on a testing programme.

Discussion

In this chapter I have described the reasons why participants in this research play football and are involved with amateur clubs. Understanding the motivations for occupying these spaces is important when considering how best to implement Chlamydia testing in football clubs and provides context for the following chapter on practical issues for delivering testing.

The primary reason for playing is enjoyment. Secondary reasons include health benefits to participating in cardiovascular exercise. Men enjoy playing football for a number of reasons and are frequently nothing to do with the act of kicking a ball around, although this in itself is fun. More importantly, participation in football clubs and teams allows men to be included within homosocial groups and to benefit from the advantages to masculinity that this gives them. From a young age, men use football to learn and practice normative gender roles with other boys.

Showing interest in football aligns then with a powerful majority in society and with the ideals which organised sport promotes through its "ritualised warfare".

At an older age, men use football to further their desire to be with other men and to occupy masculine spaces. Men assert their masculinity by engaging in other, risk taking behaviours which were unavailable to them as children. Binge drinking, poor diets, smoking and bragging about successes with (female) sexual partners ensures that men continue to project acceptable and normative masculine identities. To be successful in this endeavour, men must believe that the other men in the team are the same as them, that the other men are also projecting acceptable masculine identities. Simultaneously, the individual also believes that he is projecting an acceptable masculine identity to others, that he passes and is accepted as being the same.

Any behaviour or action which has the potential to demonstrate a difference between the individual and the group is seen as a major threat and forms the basis of what is and what is not acceptable when offering Chlamydia testing in the club setting. In keeping with Goffman's 'Framework of Stigma', participants in this research perform within front and back-stage arenas. In front of others, they are careful to maintain performances which are compatible with expected behaviours. Testing for Chlamydia is a stigmatised behaviour with the potential to damage the self. This is especially true when considering the use of non-traditional settings as venues to engage individuals in testing. Whereas hospital and clinical settings for testing are, for the most part, removed from individual's everyday life - a back-stage performance - bringing testing opportunities to non-traditional venues places

testing behaviour very much front-stage. However, as I explore in the following chapter, this is not an insurmountable problem, just a very important issue to be aware of.

CHAPTER 6: PRACTICAL CONSIDERATIONS FOR DELIVERING CHLAMYDIA TESTING IN FOOTBALL CLUBS

Introduction

In the previous chapter I have described the social context in which men play amateur football in order to better understand their attitudes to being offered Chlamydia testing in those settings. In this chapter I present men's attitudes to various components of the proposed testing pathways for Chlamydia testing in football clubs. The methodology is described in Chapter 3. I have used the consolidated criteria for reporting qualitative research (COREQ) as a framework for presenting this chapter (Tong, Sainsbury *et al.* 2007).

These interviews are the first part of a multi-stage, mixed method research study. They aim to explore the acceptability of three different models of promoting self-collected urine testing kits for chlamydia within amateur football clubs;

1) Health care professional promoted testing;

2) Coach or captain promoted testing, and;

3) Leaflet and poster promoted testing.

The results of the interviews will be used to further develop these three models which will be empirically tested in the second stage of the study, a pilot randomised controlled trial of the three testing models in football clubs.

This second phase of the study will not be reported in this thesis. However, it is useful to understand its design as this impacts on the methodology of the interviews. It is a pilot RCT which will be run in six amateur football clubs in Greater London. Each of the three testing models above will be run in two clubs. Clubs will be matched for size (numbers of teams) and general demographics of players (age, ethnicity). 200 men will be approached from across six clubs. If 50% uptake screening, then it is estimated that there will be 95% confidence that the true uptake rate is between 43%-57%. Therefore each club needs to have around 60 players. As there is considerable variation in the sizes of teams within leagues, the larger clubs need to be reserved for the pilot trial. Furthermore, the pilot trial requires a level of club infrastructure (club house, changing rooms, toilets etc) that many of the smaller clubs do not have access to. This meant that before approaching clubs for either stage of the study some clubs were discounted for the pilot study stage because of their small size and lack of facilities.

1. General attitudes to health promotion in football clubs

In broad terms, promoting general health in football clubs was acceptable to participants. For many men, secondary reasons for being in the club setting were for improving their health and therefore they already felt in the right frame of mind to receive health messages. However, there were several factors which made

health promotion more or less acceptable to them. As these men were playing football, cardiovascular fitness was felt to be important. Health promotion which clearly addressed ways in which to improve their performance on the pitch, and recovery after playing, was seen as particularly relevant and acceptable. If this link between the health message and performance was less obvious, then men were more sceptical about it because of the impact on their main reason for being in that setting - enjoyment and socialising. In this way, men weighed up the perceived benefits and costs of individual health promotion messages in the football setting when deciding on its acceptability.

> *P "I think within any setting it's extremely important to always promote health… But then within a sports environment I think it has to be implemented, because it makes such a difference. It makes such a difference. If you have a healthy player and a non-healthy player, performance will be completely different."*
>
> ***Participant 005***

Knowledge and advice which was seen as specialised was particularly valued; for example, education about nutrition and its impact on performance. In contrast, health promotion about subjects in which men already felt well versed was seen as less acceptable and possibly patronising. Therefore, football settings were not viewed as ideal settings to provide advice about drinking less alcohol and not smoking for example, even though these were recognised as things which impact on performance. Furthermore, many clubs positively encouraged these behaviours

through post-match events, tours and nights out. As discussed in the previous chapter, engaging in risky health behaviours was common for many young men and allowed them to demonstrate their normative gender identities.

> *P "...I think everybody knows about, for example, smoking and it would be a little bit perhaps patronising to speak on smoking, whereas STIs, you know, I don't know if there's any statistics about this, but people tend to be a bit uneducated about it until it becomes a problem, sort of thing..."*
>
> ***Participant* 016**

In addition to the impact health promotion may have on performance, there were other perceived benefits of receiving health messages at the club. In particular, it was seen as a relatively passive way of gaining knowledge. Men did not have to make a special effort to seek out information - instead it was brought to them. However, this created a potential problem. As I have discussed in Chapter 5, men are primarily in this setting for enjoyment. Therefore anything which potentially limited their ability to enjoy the experience of being at the club was viewed unfavourably. This included the time taken, and the way in which, health promotion was delivered. So, on the one hand, health promotion at the club offered the potential to save men time by bringing information to them, whilst on the other, it threatened to negatively impact on the time they had set aside to engage in recreational activity. This central idea that playing football with your

mates is fun and receiving health promotion isn't, created a cognitive dissonance for some men.

> *P "So I would see that as a benefit actually because again, unless I go to the doctors where I've got an illness of sorts, I'd never see any of that information. And I certainly wouldn't look for it on the internet so I can see it only being of benefit really… Some people might consider it, you know, I come down here to play football, I have my own thoughts and opinions… I don't choose to be, I guess, spoken to or lectured in this manner. If I wanted to get this information I'd go to my local health clinic. I'd have a look on the internet or speak to somebody who is informed in these topics, I guess."*
>
> ***Participant* 006**

2. Attitudes to sexual health promotion in football clubs

As discussed in the previous section, a tangible link between the health promotion message and football performance was felt to be important. This immediately created a problem for delivering sexual health promotion in the clubs. No immediate or obvious connection between being free of sexually transmitted infections and performance on the pitch could be seen by participants.

P "...on the whole, Chlamydia and football don't really seem to really overlap. So that could be seen as a slightly strange message to be receiving..."

***Participant* 014**

Furthermore, discussing sexual health and promoting safer sex was viewed by some as completely polar to the very behaviours which these men already exhibited and wanted to demonstrate to their peers. Being one of lads requires a certain ambivalence to these issues. To appear too concerned with good sexual health does not fit in with ideals of hegemonic masculinity.

P "...on an afternoon playing football you wanna talk about women, football and beer, not about sexual health to be honest."

***Participant* 007**

In spite of this, rather counterintuitively, many participants did not seem to be concerned that there was no obvious link between sexual health and performance. Instead, it was enough for some men to see that there might be other benefits of targeting young men at football clubs who were probably sexually active. As with general health promotion, some of these benefits were about reducing the time taken to seek out information from other sources - the internet or specialists for example. For others, although it was felt that men liked to feel they appeared knowledgable about sex, many felt they lacked important knowledge and would

personally benefit from receiving more information. As discussed in Chapter 5, men were already discussing sex with each other at the clubs. Therefore, as one participant put it, introducing sexual health promotion would not be "*completely left field" [Participant 013]*.

> *J "And do you think that's* (the football club) *a good place to have access to that kind of service* (STI testing kits)*"*
>
> *P "…,I'd say, yeah, 'cos you've got a lot of lads who would go out on a Saturday night and, do you know what I mean, pull a lady. So it makes sense for it to be there, do you know what I mean?… So it makes textbook sense for that to be brought to the attention at the one place where every lad is on a Saturday before going out."*
>
> ***Participant* 012**

Men's previous experiences of testing for STIs was variable, with some men never having had a test whilst others had received previous STI diagnoses. Many factors had an impact on their reluctance to test. Testing for STIs, even curable ones, could be a frightening experience for men, especially when considering the possibility of receiving an unfavourable diagnosis. For these men, avoiding a test meant avoiding being labeled as sick, even when they knew that they may have an undiagnosed asymptomatic infection.

P "I don't bother to search for it because I think I'm okay, like everybody does. Another thing is you are always afraid of the result so you tend to think, I'm okay, I don't want to know. It's stupid, but you tend not to go because you are afraid of the results."

***Participant* 018**

Therefore, unless men felt that something was wrong, they would not actively seek out health information or help. It was not the case that men feel their sexual health was unimportant, rather that to pursue a test when they lacked symptoms required several significant barriers to be overcome. As seen in the results of the stratified random probability sample survey (Chapter 4), being offered a test is acceptable. It is the act of seeking the test out that puts men off. For some men this was about being seen by other people at a clinic. For others it was the requirement to talk to a stranger about their sex lives and to have an intimate examination.

P "Actually examining you. Everyone is different. Talking might be a bit awkward to some. I wouldn't care about that. Just the examination part."

J "So that might put people off going?"

P "Yeah. I'm sure that's why the majority of people don't get themselves checked, because they don't want to get examined."

***Participant* 017**

Many other significant barriers existed for men. There was a considerable time cost attached to attending a clinic. Finding, traveling to and spending time at a clinic were all barriers to testing for men. Therefore, having an opportunity to test within the context of their daily routines and activities was popular. The idea of enjoyment and fun also factored into why men avoided clinics. They are not seen as places that men want to spend time.

> *P "…with men there's a great deal of apathy about anything that's not a big heap of fun to do outside their general busy lives. …It's just quite low down on most bloke's radars. I think most guys, beyond a misguided few, will admit that they should do it. It's just you need to give them a much, much easier opportunity to do it…"*
>
> ***Participant* 003**

Some men highlighted that attending a clinic did have some positive aspects. The opportunity to speak to an expert in sexual health was especially valued as was the ability to be seen and treated if they had symptoms. However, as previously mentioned, there was less impetus to attend a clinic when asymptomatic. Clinics were also viewed as anonymous and discreet by some men. Therefore, for most men, the decision of whether or not to attend a clinic was made on a weighing up of the pros and cons - the barriers and motivators. Having symptoms was a strong motivator for men. If they felt unwell or feared something was wrong with their genitals then they would find the time to seek out help. This demonstrates that some things are more threatening to masculinity than others. The threat of having

diseased sexual organs, or being unwell and unable to perform daily expected duties, outweighs any threat from health seeking behaviours.

> *P "...from a personal point of view I wouldn't really want to get tested unless I was ill almost. And I know that's wrong but it's kind of the way it is and kind of like, you know, to sweep something under the carpet almost."*
>
> ***Participant* 009**

Therefore, having sexual health promotion delivered at the club was a useful way to gain information that men wouldn't actively seek. For some men it also meant that potentially health could be discussed in an environment in which they felt at ease rather than having to navigate the barriers involved in going to see a doctor. The club setting was seen as an environment which was familiar and unthreatening, and fellow team mates were viewed, by some, as people that were trusted.

> *P "...as a team, as a club, you probably put your trust in them, so maybe you can be comfortable to speak with them about this. Yeah, you only need to give the chance to talk about it."*
>
> ***Participant* 011**

3. Delivery of the promotion message

The best time to deliver a health promotion message was dependant on several factors. On the whole these related to ensuring that the time taken for the men to listen to a message had a minimal impact on competing interests. Before a match, some men felt that their attention may be on the game rather than Chlamydia, whilst after the match men may want to leave quickly to spend time socialising in the pub or with family. However, other men felt that there was often a lot of time before a game when men were sitting around doing nothing and this would be a good time to listen to a sexual health message. Training sessions were viewed as more relaxed and could be better times to discuss sexual health. However, training sessions were not held by all teams and rarely well attended for those who ran them. Time was also very tight during training sessions with men turning up five minutes beforehand and leaving quickly afterwards. Therefore, whilst they were a more informal and relaxed environment in which to discuss sexual health, some felt them to be an inefficient forum.

> *P* "*...you'd be taking up the players' time, 'cos that's why I keep mentioning 10 or 15 minutes, you'ld have to make it concise. It couldn't be more than that I don't think. Especially if it's after training people wanna get home. So it'd just be like a quick session."*
>
> ***Participant* 016**

Some men suggested using other club events as opportunities to deliver sexual health promotion. However, events that had good attendance from the club

members were also infrequent and linked to other important events such as the annual general meetings, prize givings and big televised football matches. So whilst these had the potential for reaching many men at one time, they were not felt to be the best occasions to receive sexual health promotion.

The impact of time, and efficient use of, was also felt to be relevant for whoever was going to deliver the message. Men were concerned that visiting health care professionals would be busy and expensive and therefore may not be a good use of resource. On the other hand, this had the potential to increase attention and minimise any disruptive behaviour as this would be disrespectful to the professional.

> *P* "*I don't think there is any need to get a doctor there, talking about it, 'Okay, this is treatable with some pills.' It would be okay, but it's more unlikely to happen because it's much more expensive. The success rate, I think maybe it would be a bit higher, but not that much. So maybe it's not justified.*"
>
> ***Participant* 018**

Participants did not feel that the sexual health message needed to contain very detailed information about sexual health. Instead, men favoured short, quick, simple and practical messages which focussed on the benefits of testing and how to test. For some men no particular message was necessary. Instead they preferred only to have the offer of a test and felt this would be sufficient to encourage them to use it. Once again, ensuring that men were not singled out and made to feel

separate to the group is important. If all men receive the message then the process becomes more acceptable.

> *P "I don't think he needs to say something, just needs to, 'Today we're going to do this.' That's it [laughs]."*
>
> ***Participant* 011**

A balance between brief messages and more information was important to some men to ensure messages were not perceived as frightening and to preserve a feeling of autonomy. Therefore, signposting to sources of further information was valued. Achieving the right balance between too little and too much information was potentially difficult. However, it highlighted the fact that men lacked basic knowledge about sexually transmitted infections, especially how easy many are to cure.

> *P "So if you don't know, if someone says do this test you might have this, but you don't know what this is then the unknown's always scary to people. So, you know if you explained, you know, 'Do this test, you may have Chlamydia. You may not show any symptoms but if you've got it these can be the long-term effects, you know. It's quite easily spreadable so this is it and also what we'll do is give you a couple of tablets. You'll take them there and then and you're done.' All of a sudden, well that's*

not scary, it's just like having a cold or something I think, when you break down the walls like that it's a better way to do it."

***Participant* 013**

4. Characteristics of the message provider

Attitudes to three different models of sexual health promotion in football clubs were explored with participants: 1) Coach or captain led promotion; 2) Health Care Professional led promotion; and 3) poster led promotion.

Attitudes to coach or captain led promotion

Attitudes towards coach or captain delivered promotion were mixed with some men reporting that this would be a good option whereas others raised a number of concerns. Because sexual health was seen as a personal issue for many men, some would prefer to hear about testing and to discuss STIs with people they already know (someone from the club). However, for others, there was concern that other members of the club may not keep sensitive issues confidential and may lack expertise and knowledge about important sexual health issues. In fact, whilst being a peer could have been a positive feature, it was also cited as a potential negative with some men questioning whether or not it would be appropriate for men who they viewed as the same as themselves to promote sexual health. Furthermore, it would be potentially patronising and hypocritical to be told about

sexual health by men who they knew to be having sex with multiple partners, without condoms and under the influence of alcohol.

> *P "I think with a manager you'd be kind of like, unless he was reading it, you're kind of like, has he made that bit up?"*
>
> ***Participant 012***

Attitudes to Health care professional led promotion

For the most part, health care professionals were viewed as authoritative and knowledgable and a suitable source of information about sexual health. This meant that the concerns voiced about receiving health promotion from team captains were overcome. So whilst some men felt that discussing sexual health with a stranger might be awkward, others were happy with the idea. Furthermore, by having an external professional come to the club, men felt that any banter and disruptive behaviour that may have occurred with a peer delivering the messages would be minimised. This was because it would be seen as disrespectful given the HCP's professional status and time given up to come to speak to the men.

P "I think for a start you would think, this person has given up their time on a Saturday to come and talk to me. The least I can do – they've come down to wherever it is I play football. They probably work Monday to Friday. The least I can do is at least show them some respect and listen to them."

Participant 015

However, certain factors, such as age and gender, were felt to be important and had the potential to alter how men felt about HCP delivered promotion. The idea of a female HCP coming to the football club was often initially met with amusement and sexist or misogynistic language. However, on further questioning, men felt that having a female HCP come to the club was less about how the message was received and more about the feasibility of a woman coming to talk to men in the changing rooms. The environment of the clubs is very masculine by nature of the all male teams and homosocial norms. Therefore maintaining that is important. Conversely, a few men felt that they may be more willing to engage in conversation about sexual health with a woman although they could not articulate why this was the case. Because men preferred to discuss issues of sex with men who they viewed as similar to themselves, and because HCPs are seen as slightly other because of their professional status, matching other variables such as gender and age ensures that messages have the best chance of being heard.

P "...if you had a nurse or a doctor I'd get someone of your age to come in rather than a 50-year-old. Because if you've got a doctor that's

coming in it's immediately, 'Oh he's a doctor. How am I going to relate to a doctor?' If he's a 50-year-old doctor you're not. If he's someone closer to their age then you are much more likely to, I would think. "

Participant 004

Attitudes to poster-led promotion

Posters were seen as the most discreet method of providing sexual health information as it would not be apparent to others whether or not the men had read them. Another advantage was that they would have minimal impact, if any, on the men's time. Whilst this was seen as an important advantage over the other two proposed models, it was precisely this discreet nature of them which was also their disadvantage; they were likely to go un-noticed and lack any definite impact. Therefore, they were seldom preferred to coach led and HCP led promotion as a method of sexual health promotion. Instead, they were seen as a potentially useful adjunct to the other models, something that could provide further information to men who were unwilling to ask questions during coach or HCP delivered messages.

P "...I think that would be kind of a decent option because it's kind of not forcing it on anyone. It's kind of there if you want it. It's not saying that, 'You need to sit down and listen to me about what I say,' it's kind of just there if you're interested. Which I think is possibly a better way to approach it."

Participant 010

5. Features of the testing kit and process

Participants were asked about their opinions on various features of the testing kit and process for testing. A standard outreach model of Chlamydia testing was used as the foundation for the proposed testing process. Testing kits would contain urine specimen pots and have envelopes for free-post return to the laboratory. An alternative way to return the test kit would be to leave it at the club for collection and this option was also explored. Because of these two options for returning test kits, men could use the test at the club, at home or another setting. Their attitudes to these otpions was also explored. Results for the test, both negative and positive, would be sent to participants by text message as with many clinic based services.

Appearance of the testing kit

Although the testing kit is only comprised of a few pieces of equipment, the way in which this can be packaged is almost limitless and the appearance of the testing kit was important for some men. Most important was that the testing kit should be discreet and not immediately identifiable as a test for STIs by others. This is

because testing is stigmatised and men wanted to maintain a degree of confidentiality around the whole process, especially if the testing kit was going to be used in a setting outside the football club. For those men who imagined using the test kit there and then, the appearance was less important as other team members would know what the package contained. Men who lived in shared accommodation or with family were especially keen that kits did not draw attention if accidentally found.

> *P "If someone has been in and given us a talk then everyone knows what's in it. You can put a big red cross on it. You can put Chlamydia on it. You could put some kind of comedy cartoon on it. I don't think it would make any difference personally because everyone knows what it's there for."*
>
> ***Participant 003***

However, having test kits look discreet and anonymous had to be carefully balanced with having something that looked professional and of value. Men wanted test kits to look as if they were "*sciencey" [Participant 005]* and something which they could put their trust in. Otherwise, the testing kits may be at risk of being thrown away unused. To make matters more complicated, very discreet packaging had the potential to reinforce stigma and shame related to STIs whilst packaging that mentioned Chlamydia, for example, was potentially "*intimidating" [Participant 014]* for some men.

P "If it was a plastic bag it might give the impression that it's not a good bit of kit. If it was like a – you know when you get a prescription for something it's in like a paper bag or sealed paper bag with a fold, that looks like something more official, I guess because you associate plastic bags with supermarkets or whatever, that with a doctor's prescription.

...So if it looks more valuable or looks like – I think you'd treat it with a bit more respect or just, intuitively, not throw it away, if it's not a plastic bag."

Participant 016

Using club specific logos and colours on the test kits was generally felt to be a waste of money by most men, unlikely to increase engagement and potentially gimmicky. However, the Premier League were a community partner in this research grant and the suggestion of using Premier League branding was viewed positively as it is strongly associated with aspirational values.

P "Because you'd relate it to the football stars and we all look up to them. Yeah, I think that would do good."

Participant 017

Distribution of the testing kits

Several potential methods of distributing the test kits were discussed with participants; having a central collection point for test kits from which men could help themselves to test kits, having test kits handed directly to the men by whoever was delivering the health promotion and having to ask for a kit from the team captain or visiting health care professional. The most popular methods were those which minimised any potential embarrassment, the feeling of being singled out and felt stigma. However, some of these issues were more important and could over-ride others. For example, handing kits out to everyone was not the most discreet method of kit distribution but ensured that no one was singled out and that those who may be too embarrassed to pick up a kit now had one in their possession. Therefore, for many men, this was seen as the best way to distribute test kits.

> *P "...if you have these kits that people have to go over and pick up, thinking, okay, I need one of these, whereas if they're kind of literally handed out, 'Here's your thing, here's your thing, here's your thing,' I feel like once you put that in someone's hand, again that's the kind of situation where there will probably be some people who will take it and think like, 'I'm only taking this because you're giving it to me,' but who actually are probably thinking, 'I'm quite happy this has been given to me because I would quite like to do this,' and they may not have had the confidence to go over and pick one up. Because again it is just that whole thing that as soon as you actively step towards doing this that is, in some*

people's case, an admission that you have a reason to do it. So having something handed to you does get over that hurdle."

Participant 014

However, not all men had negative feelings about being seen to pick up a testing kit. In fact, for some, it served as a way of affirming their masculinity and maturity in front of others. By being seen to pick up a test kit, to actively seek one out, served as a way to show others that they were sexually active and would need to test in order to maintain sexual prowess. Whilst handing the test kits out to all men was the preferred method for most men, some men also valued the opportunity to have test kits available to pick up from a central collection point as this maintained their options and perceived autonomy in the process. It also meant that men could take more than one testing kit to distribute to their friends.

P "…'cos it's in a lads' environment, it's all like, oh he's got a testing kit, he must be getting some action. That kind of thing. So I think 'cos it's in that environment I don't really think people would be embarrassed about it. They'll probably go, yeah, you know, I had this girl last week and a girl the week before and you just get a bit, a lot of egos flying about and it will create a lot of banter I think."

Participant 007

Using and returning the testing kits

Once again, in order to maintain a degree of autonomy over the process, men valued having different options when it came to where and when to perform the test. Some wanted to do the test there and then at the club, whilst others preferred to take the test kit home with them. In coming to this decision, men balanced the benefits of convenience and time with confidentiality and autonomy. Performing the test there and then allowed men to fit testing into the context of their daily activities rather than have to actively seek health care and fit testing in around their busy lives. However, using the test at the club also made testing an event which could be observed by others, which had the potential to be stigmatising. On the other hand, some men felt that this could also have positive effects on encouraging other men to take up the opportunity of testing through a "*domino effect" [Participant 013]*. Seeing other men do a test had the potential to allay fears and concerns about doing a test. Doing a test there and then also meant that men could quickly forget about the experience and avoid confronting any fear attached to receiving a positive test result.

> *P "I'd probably go, 'I tell you what, I'll do it now.' And then you'd probably have another couple of lads go , 'Yeah, no sod it, let's do it then.' Then I think if the lads in the changing room saw a couple of lads doing it there and then, they'd be like, oh might as well do it, or whatever,…"*
>
> ***Participant 012***

Whilst using the testing kit at the club had some advantages, it also came with some concerns. These, once again, revolved around confidentiality and fear of team mates tampering with test kits. It was also a concern that whilst health care professionals would feel happy receiving urine samples, non professional promoters may have concerns about collecting used test kits. Some participants were married or in relationships. Whilst they did not feel that being offered a testing kit would be problematic for them, many feeling they would take up the offer to test, there was some concern that other team members might tell their partners that they had tested. Because some men felt that doing a test may be an admission of risk, this had the potential to cause problems. In this way, the whole process of testing was seen, by some, to be more relevant for certain men, especially those who were perceived to be more promiscuous or perhaps less likely to test via traditional routes.

> *P "So people don't feel comfortable doing the test, because it sounds like you've behaved wrong. And also it can be like – I have a girlfriend, for example. If I do the test in front of my team mates, my team mates can go and talk with my girlfriend, 'Be careful. Your boyfriend is getting tested. I don't know if he's been behaving himself.' I don't know. It's just because it's a difficult area. The confidentiality is queen here – it's king or whatever."*
>
> ***Participant 018***

Receiving results

Participants were asked about their feelings towards receiving test results via text messages sent to their mobile phones. Some men felt this was a good way to receive results as it was simple and did not require men to either seek out the result or take time to speak with someone. However, others expressed concern about receiving positive test results in this way and valued the opportunity to speak directly with a health care professional in those circumstances. Confidentiality was, once again, important and any risk of the text message being seen by others was taken seriously.

> *P "Getting a text message is, I think, great because you just get it straightaway. And again you're not even having to speak to someone to phone up and get your results like you do other stuff, it's just there and you can read it."*
>
> ***Participant 010***

Discussion

These interviews were conducted to explore the acceptability of three different models of Chlamydia testing in amateur football clubs among young men who play in those settings. The results of these interviews will be used to develop a pilot study of testing in football clubs. The main finding of these interviews is that offering Chlamydia testing in football settings is, under certain situations, acceptable. Factors which influenced men's attitudes towards this way of testing

can be considered within three main themes: 1) Characteristics of the provider of the sexual health message (coach/ health care professional/ poster); 2) Characteristics of the testing pathway itself (how, where and when to use the tests); and 3) Characteristics of the men themselves. In the background, differences in demographic factors will also play a role as do broader themes about how the men feel they are viewed by others, avoiding stigma, ideals of masculinity and reasons for being within a homosocial environment. I have summarised these factors in the following table.

Factors relating to acceptability of chlamydia testing in football clubs

Provider characteristics

1. Coach/ Popular opinion leader
    a. Familiarity may act as promoter or barrier
    b. May be more likely to test if the person is respected within the club
2. Health Care Professional
    a. Effect of age and gender of HCP is mixed
    b. Respect for the HCP's knowledge, professionalism and time
3. Posters
    a. Positive influence related to discreet nature of posters
    b. Discreet nature also means they are easily overlooked
    c. Best used in combination with methods above

Characteristics of Testing Pathways

1. Cost
    a. Time: Brief messages, minimal impact on football
    b. Value: Professional looking testing kits
2. Convenience
    a. Fit in around normal, scheduled activities
    b. Options to perform test in a variety of settings
3. Discreet settings
    a. Opportunities to test in settings which maintain anonymity and reduce stigma

Men's Characteristics

1. Stigma
    a. Desire to be distanced from association with STIs
2. Emotional response to sexual health/ STIs/ Testing
    a. Fear of STIs (linked to stigma and knowledge)
    b. Embarrassment (linked to perceived maturity and stigma)
    c. Amusement (linked to ideas of gender performance)
    d. Boredom and apathy (linked to knowledge and gender)
3. Knowledge
    a. Can act to create fear of STIs and testing
    b. Uncertain where and how to access traditional services
4. Gender role performance
    a. Reluctance to seek health advice unless sexual function impaired
    b. Perception of individual by others and maintaining status

Demographic factors

Effect of age, ethnicity, cultural background, social class, education and sexual attitudes

Strengths and weaknesses

There are a number of strengths and weaknesses to this study. Interviews were performed until saturation was reached and no new ideas expressed by participants. The one to one interview process allowed men to express their thoughts about STIs and the testing pathways without fear of judgement from others which may have been an issue if focus groups had been used. This also allowed a rapport to be built between myself and the participants during the interview so that they felt more comfortable to discuss potentially sensitive issues.

Although I used a convenience sampling method, there is a degree of diversity within the sample in terms of age, relationship status and ethnicity (see appendix). However, no participants are Black and most are employed with at least further if not higher education. Therefore, although it seems common sense that issues of stigma relating to STIs and testing, how others view you and impact of testing on your time would be important to all men, further interviews may need to be done with men from other communities to confirm this. All apart from one participant identified as heterosexual. I do not think this is an issue as the sexual health needs of men who have sex with men are different to men who only have sex with women and the proposed models of testing explored may not be appropriate for them. Engaging MSM in sports settings may yield different findings as so much of what was discussed revolved around masculinity and MSM may inhabit a subordinated masculinity. Therefore, further interviews may need to be done if MSM were to be specifically targeted in sport venues. Because of this convenience sample, it may be argued that this is a self selecting sample with behaviours and attitudes towards sexual health which are different to non-

participants. Whilst this is difficult to completely rebuke, it is obviously never possible to interview men who will not take part. The diversity within the sample and interviewing until saturation was reached also help to make this sample representative.

A number of methods were employed to increase the validity of the findings. Discussion between myself and other researchers in the team (Lorna Sutcliffe and Claudia Estcourt), took place at all stages of the research process. This helped to ensure that data were collected, analysed and interpreted in an appropriate manner. Coding and development of themes was done primarily by myself but with help from Lorna Sutcliffe. This meant that coding and themes were being checked by two researchers to increase validity of the findings. Where appropriate, I have backed up my findings in the results section with quotes from participants to illustrate the themes. I have also used a range of participants' responses to ensure a representative picture is presented.

The English Chlamydia Screening Programme currently performs more tests in woman than in men. Some of this can be explained by the settings in which screening is performed, with perhaps greater opportunities to screen women in existing health systems (family planning, termination of pregnancy, pharmacies). However, many outreach programmes and one off testing events rely on men approaching testing stands or being approached on an individual basis by NCSP staff in public settings. Furthermore, these testing events are often taking part at social and recreational events and are therefore competing for time with men's

main reason for being at the venue. Based on the findings from these interviews, I would suggest that professionals involved in planning these testing strategies need to be aware of the factors influencing men's decisions to test. In particular, ensuring that men's standing in front of others is not damaged and that the impact on their main reason for attending the venue is kept to a minimum. It should be noted, however, that the NCSP now discourages outreach, instead focusing on embedding screening within existing general practice settings.

I am not aware of any other published studies or testing schemes whereby qualitative methods were used prior to setting up a chlamydia testing programme for men. Using this approach will help to inform the next stage of the research programme; a pilot randomised control trial of three testing models in football clubs. Without the qualitative study, the testing models used may have been very different. The findings also enable us to develop the pathways and have evidence based reasons for each step used in any process. Too few studies use this approach to implementing screening events which results in a limited understanding of how and why programmes work or fail.

Provider Characteristics

Three models of sexual health promotion were explored with the participants: Coach led promotion, Health Care Professional (HCP) led promotion and poster led promotion. Familiarity with the promoter had a mixed effect on the acceptability among men. Because of the sensitive subject topic, some men preferred to talk about sex with people they knew, for example the coach or

captain, whilst for others this may act as a barrier. Respect for the person within the club who was delivering the promotion was important to ensure the message was taken seriously and that they were not seen as hypocritical or lacking in knowledge.

Men generally felt that health care professionals were knowledgable and authoritative. As a result, many felt that they would be taken more seriously than an internal health promoter, although there were mixed opinions about what effect their age and gender would have on the process. A perception that younger, male HCPs would have similar life experiences meant that some men would be more willing to listen to them than female or older professionals. Because of the desire to keep the impact on time to play football to a minimum of receiving the health promotion, having a male HCP would allow for men to continue changing and showering in the changing rooms with little interference.

The most positive perceived characteristic of posters related to their discreet nature. However, for some participants, this was also considered a negative as they could be easily overlooked and therefore lack any impact whatsoever. Whilst posters were felt to be relatively ineffectual as a sole method of health promotion, it was suggested that they could increase the impact of other promotion methods if used together.

Popular opinion leader theory, based on Roger's theory of Diffusion of Innovations (Rogers 2003), suggests that individuals are more likely to act on

advice or adopt a new innovation (in this case testing for Chlamydia) if this is promoted to them by a member of their community at the centre of communication networks. Whilst this holds true for some of the participants in this study, not all men favoured hearing about sexual health from another member of the club, even if they were well respected within the team. However, when considering HCPs, it seems important that they have some similarities to the men within the team in terms of gender and age. The importance of this goes beyond practical issues of being in the all male environment of the changing rooms but includes the assumption that there will be a common understanding when it comes to sex and sexuality. Therefore, even though HCPs are not directly from these men's football communities and occupy a position in society which may be removed from these men, they were not dismissed as acceptable providers of sexual health promotion in this setting. In fact, there is this balance between the delicate and stigmatised nature of sexual health and the comfort of discussing these issues with someone you know personally, and see as no different to yourself, and a HCP who is unknown but an expert.

Characteristics of the testing process

Key factors relating to the testing process were those of cost in terms of time and value, convenience and testing in a way that minimised felt stigma. To these ends, men valued processes which were quick, did not interfere with their main reasons for being at the club (to play football and socialise), fitted in around their daily activities and routines and that gave them opportunities to test in a variety of

settings to maintain anonymity. It was also important that test kits looked discreet but also inherently valuable and therefore medicalised but not frightening.

Overall, the perceived complexity of the testing process should be kept to a minimum. This starts with when, where and for how long the promotion message should be given. Despite a concern in previous studies that men lack knowledge about STIs and that this may influence their decision to test, participants in this study were not concerned with receiving detailed information about infections. Instead, most favoured brief messages which highlight the ease of testing and simple curative treatment. These served to minimise the anxiety and fear than men can feel towards STIs and the treating process. A balance between giving enough knowledge to keep men informed and able to make a free choice and not creating fear from too much or too little information must be found.

Although few men had tested for STIs in the past this did not seem to be because of an active desire not to test. Whilst the stigma and fear of STIs explains part of this behaviour because men wanted to limit the amount of time they were engaging with a stigmatised behaviour, the time and effort to access testing was also a major barrier. The opportunity to access testing kits at the football clubs meant that men could continue with normal, scheduled and enjoyable activities and also come into contact with opportunities to test. Central to the acceptability of the proposed interventions was that it should be short and simple, thereby minimising the impact on their time. To introduce a complex and timely intervention in the football club would potentially be worse than doing nothing as

it would not only perpetuate current barriers to testing but also intrude on men's time for recreation and socialising.

Whilst handing test kits out to all team members removed a degree of free will in whether or not men got a test kit, it was a much preferred option. It took away the idea of being singled out, all the men would now be in the same position, which helped to normalise and de-stigmatise the situation as well as maintaining the 'sameness' of men within their homosocial group. Although using the test in the club setting may initiate a '*domino effect*' and encourage others to also test, a more discreet option was to use the testing kit at home and return it by post. By giving multiple options for how and when to use the testing kit, men would be able to reduce stigma attached to testing and maintain a degree of autonomy. Again, this is important in how others see them within the club; being told what to do and when to do it is at odds with ideals of masculinity and exercising free will. This idea making the process as discreet as possible is balanced with making the process as easy as possible (see below). Therefore, some men preferred to test there and then, handing the sample back to the promoter or placing it into a collection bin. This was the least complex option but came with a cost of being seen to perform a test.

The ideas of complexity also feed back into how others see them. The amount of information given needs to be non-patronising, thereby maintaining ideas of masculinity and being knowledgable about sex, but also ensure that STIs are not portrayed as frightening and stigmatising, thereby discouraging men from testing.

It could be argued that by making the testing process as basic and simple as possible, as small a number of options as possible need to be given to men for testing. This may be simple but may also reduce autonomy and once again impact on masculinity - men do not want to feel like they are being told what to do. Similarities with HIV testing exist with a move away from lengthy pre-test counselling towards opt-out testing and brief 'pre-test discussions'.

Men's Characteristics

Influencing factors were not only external but included features of the men themselves. STIs and being associated with them, either through being seen to test for them or having one, are recognised by participants as stigmatised behaviours. These feelings of stigma meant that men preferred testing options that kept any possibility of this to a minimum. Closely related to this was how men viewed and performed gender. Features of hegemonic masculinity prevented men from accessing screening for asymptomatic infections. To seek help and health care is at odds with how society expects men to perform. It also meant that anything which may tarnish their status amongst others should be avoided. For the purpose of the testing pathways, no one should be singled out for testing and men need to be able to test without others knowing that they have done so. As discussed in Chapter 5, this is in keeping with established theories of stigma.

Interestingly, throughout the interviews, men identified numerous barriers to testing but would often distance themselves from these. Participants felt that these barriers were problems for other men but not for them personally. The reasons for

this were obscure but seemed to relate to participants feeling that they were more mature than other men and therefore able to deal with sexual health issues in a different way. Therefore, although being seen to be associated with STIs is stigmatised, for some men, it was more important to be seen as a grown up and display maturity about these issues, in itself perhaps a more valued display of masculinity. In this way, participants clearly demonstrated their knowledge of how to perform a normative and hegemonic gender role but also, at times in the interviews, distanced their own behaviours from these expectations, opting instead to align themselves with a masculinity that engaged with health seeking behaviours. By bringing screening to men, not only could more convenient opportunities to screen be created but this requirement to actively seek out and ask for testing could be abolished.

Participants had a range of pre-existing knowledge about STIs and felt that information given during testing pathways should be kept to a minimum. Not only did this lessen the impact on their time but they also felt that too much knowledge could make STIs more frightening (see section above on characteristics of the testing process). Emotional responses to sexual health, STIs and testing were frequently voiced during the interviews. Fear of STIs seemed to be related to the stigma and variable knowledge about infections. The testing process was potentially embarrassing for some men but linked to their perceived level of maturity. Amusement and joking about sex and sexual health seems to be an expression of normative gender roles and ensuring that these are displayed appropriately within the homosocial, all male sports environment. Some men expressed boredom and apathy towards sexual health which, once again, may be

linked with ideals of gender performance; the body is a machine and real men should not seem interested in their health.

Summary

With these interview, I have shown that men who play amateur football and are aged between 18 and 35 years find the offer of Chlamydia testing in football clubs acceptable. Important extrinsic and intrinsic factors influence how acceptable testing is and may act as barriers of facilitators to testing. Understanding why men play football and the potential impact of proposed public health interventions on these young men is essential to designing successful testing programmes.

In the next, and final chapter I will discuss how the results of this qualitative work relate to the findings from the stratified random probability sample survey (Chapter 4), the potential implications for public health policy and propose directions for future research in this area.

CHAPTER 7: CONCLUSIONS

Introduction

Chlamydia remains an important public health issue despite significant efforts to increase general testing, to target screening at high risk populations, to improve access to treatment and to improve partner notification outcomes. Advances in diagnostic technologies has meant that collecting suitable specimen for Chlamydia testing can now be performed in non-healthcare and non-traditional settings. This has increased the possible opportunities for testing and allowed the National Chlamydia Screening Programme (NCSP) to offer testing in a variety of settings.

Assumptions by healthcare workers and policy makers that men are difficult to engage in health behaviours and are infrequent attenders in health care settings has fuelled the drive to test more men in non-traditional venues. Not only are more women than men testing for Chlamydia through the NCSP, but women are also more likely to have been tested in healthcare settings.

Very little is known about where men prefer to access Chlamydia testing and why some venues are more or less acceptable than others. Using sport venues to engage men in testing has been shown to be feasible in some studies but no qualitative work has been done with men from those studies to understand their reasoning behind the uptake or refusal of testing. Furthermore, a deeper

understanding of how to use these non-traditional venues most effectively is lacking.

The aims of the research in this doctoral thesis were to explore in which venues young men (18 to 35 years) would find it most acceptable to access Chlamydia testing through the use of a national stratified random probability sample survey (Chapter 4) and, using qualitative interviews, whether or not football clubs would be acceptable venues for testing (Chapters 5 and 6).

Where do young men want to access testing? Findings from the stratified random probability sample survey.

The stratified random probability sample survey of men aged between 18 and 35 years in Great Britain shows that men are already well engaged with general and sexual health care. Contrary to popular dogma, men regularly attend general practice settings. In fact, around 75% of the men sampled have been to their GP in the previous 12 months.

The use of self-collected urine samples to test for Chlamydia is highly acceptable among young men with more than 85% willing to use this method. Approximately 30% of men had previously tested for Chlamydia and a further 20% for HIV, showing that men are engaging, a some level, with current testing strategies.

Healthcare venues were more popular than vocational, educational and recreational settings to access testing. General practice was the most popular, even more so than traditional sexual health clinics. This fact, taken together with the high numbers of men who had been to their GP in the last year, suggest that general practice is currently under-used as a testing venue.

Sport settings were not a particularly popular venue among men as a whole. However, among those who were regularly in those setting, its popularity as a potential testing venue rose to about 50%. In spite of this, rates of Chlamydia among men in these settings may not be high enough to warrant the time, effort and money involved in football club-based testing. Findings from the pilot RCT on testing in football clubs failed to detect a single infection, although numbers tested were low. Therefore it is important to consider not only uptake of testing but also diagnostic rates.

Practical issues for delivering Chlamydia testing in football clubs

Qualitative interviews with amateur footballers aged 18 to 35 years explored the acceptability of introducing testing for Chlamydia into the football clubs using one of three different models: coach-led, healthcare professional-led or poster-led Chlamydia testing. Testing in the football club was acceptable in general terms but influenced by the impact it had on the main reasons for being in that setting - enjoyment, socialising and being with other men. Men enjoyed being around other men who had similar interests and, from a young age, these men had used football to be exposed to, and to perform, normative gender identities.

These factors influenced the practical details of how to introduce testing into the clubs. Minimising any felt or perceived stigma is important for men. Furthermore, ensuring that the status quo of the homosocial group is not upset by highlighting differences between members is crucial to the acceptability of the intervention. Men wanted opportunities to test which were discrete and maintained confidentiality whilst also avoiding stigma. They also wanted to be offered choices about how, where and when to test, thereby maintaining their autonomy. In order to avoid being seen as other or discredited, men subscribe to the norms of the group. Therefore, if everyone is exhibiting the same behaviour, and this is contained within the club, then they can limit any potential feelings of stigma. Within the team setting they occupy a single space and exist as a discrete unit which is private and hidden from general view. To test within that setting, as long as everyone else is doing so, has the potential to no longer be seen as discreditable or stigmatising.

Overall, the acceptability of testing in clubs can be thought of under broad themes relating to characteristics of the provider, characteristics of the testing pathways, characteristics of the men and external factors relating to gender performance. When introducing new testing initiatives these factors must be considered to ensure it is acceptable, although how this translates to uptake needs to be tested empirically.

Interpretation of studies

From these studies, young men appear willing to access testing for Chlamydia, and many have already done so. A wide range of settings are acceptable for accessing testing kits although healthcare venues are the most acceptable. Sporting venues are much less acceptable among men as a whole, and even among those who are frequently in those venues, only around half said they would be willing to access testing there. These findings were unexpected and had I known the results of the survey before undertaking this research I would have focused my studies on how to increase testing within general practice. However, findings from the interviews reveal important insights into how to increase the acceptability of testing, not only in football settings, but also more widely. The framework of factors which impact on acceptability (presented in Chapter 6) are relevant to other settings. Balfe *et al* have used a similar framework to synthesise evidence from testing in a range of settings (Balfe, Brugha *et al.* 2011).

Using the findings of the survey and interviews together, it would appear that general practice settings offer the potential to test a significant number of young men for Chlamydia. These venues are accessed by the majority of men on a regular basis. Because of this, men do not have to fit testing into work/life schedules. No new points of contacts need to be created and this may offer significant cost savings over current testing strategies. Furthermore, unlike with football clubs, men are already in a health setting and this limits any potential dissonance between the primary reason for being at the general practice and the idea of testing for Chlamydia. Men are not there for recreation and therefore

testing will have less of an impact on their time. This point was made more than a decade ago by Hart, Duncan and Fenton based on data on attendance at GPs by men (Hart, Duncan *et al.* 2002). My work supports their recommendations through primary research.

General practice is the preferred venue for accessing testing kit. Listening to what men want and how to provide acceptable testing opportunities should be central to service development. Creating novel methods for Chlamydia testing can be costly and fail to deliver in terms of numbers tested and infections found and treated. The potential advantage of using general practice is that the infrastructure already exists and the general function of those settings is well understood by service users. Furthermore, they are not necessarily associated with sexual health and infections in the minds of users. This means that any stigma associated with testing for STIs can be minimised. Offering a test to everyone who comes to the practice, and explaining that this is what happens, mitigates any stigma felt by being singled out for testing.

For health professionals, and General Practitioners in particular, findings from the interviews should also be reassuring about how little effort is required to deliver testing. Men do not need, or want, extensive counselling about what Chlamydia is before testing. Just being given a test to perform either in the surgery or at home, should be acceptable, and quick. However, GPs may be reluctant to take on further roles in which they feel unskilled, under supported or under compensated. Understanding potential barriers from GPs to offering testing need to be explored and overcome if this strategy is to be taken forward.

So if men want to test in general practice and traditional healthcare settings, is it worth pursuing novel venues at all? Whilst existing venues are being underused, novel venues may reach men who would not access testing in other settings or who have never tested before. However, in a health economy with limited and decreasing resource, using what currently exists, and using it in the most effective way, should be a priority over development of new testing initiatives. We don't currently know how best to use what we have, so how can we justify the use of novel settings? Certainly it should not be argued that men won't access traditional venues. Diagnostic rates are also likely to be higher in traditional healthcare settings further strengthening the effectiveness of screening.

Furthermore, the impact of masculinity of health behaviours is complex. It should not be assumed that men are a homogenous group with the same experiences and desires as all other men. Although participants in the interviews demonstrated a clear shared understanding of hegemonic masculinity, normative gender performance and the potential impact of these on the acceptability of offering Chlamydia tests in football clubs, at an individual level they had very few personal objections to the idea. Frequently these men talked about how they didn't have a problem with testing but "other" men might. In doing so they often placed themselves in opposition to hegemonic masculinity. Together with the results from the national survey, we can see that men are not confined by expected behaviours and are already highly engaged with health services even when these services are not specifically designed with them in mind. As suggested by

Douglas *et al* (Douglas, Greener *et al.* 2013), current initiatives to reach more men assume that behaviours are governed by hegemonic masculinity and fail to understand the diverse way in which men perform gender and the wider impact of factors such as age and ethnicity.

Policy context

Although the English National Chlamydia Screening Programme was initially focussed on testing in women due to the putative reproductive morbidity caused by Chlamydia, men have also been part of the programme for many years. Testing rates in men are lower than those for women and men are less likely to have been tested in a "core" health service setting. The results of the research in this thesis suggest that, as with testing in women, men should be targeted in existing health venues. It should not be assumed that men do not access these venues and evidence already existed to challenge this dogma. Results from the stratified random probability sample survey further support this.

Clearly, using general practice settings to test more men is easier said than done. An estimated 23% of chlamydia cases in women versus 5.3% in men were diagnosed and treated in general practice between 1990 and 2000. (Cassell, Mercer *et al.* 2006). More recent studies have been halted because of too few chlamydia tests being performed in general practice to allow meaningful results from a randomised control trial (Cassell and Estcourt 2013). Engaging GPs with this process may be a bigger challenge than engaging men. Economic incentives, shifting money away from NCSP testing and into targets for GPs, is a potential

way to increase testing. However, as shown in another ongoing study, testing rates are low even when they attract a significant tariff (Estcourt 2013). This process may be further complicated now that local services are funded by GP consortiums. Whether this will be seen as an opportunity to improve the sexual health of local communities and to do so in a cost effective way remains to be seen.

It is also important to note that specific targeted campaigns for certain groups, and outreach in general, may be useful. Not all men are at equal risk of infections and this may justify novel testing programmes. Similarly, access to healthcare and appropriately pitched public health information can be variable. Testing in non-traditional venues may help to raise awareness of health issues among men who do not access health settings or encourage them to visit existing health services even if testing in non-traditional settings is not cost effective in its own right. However, measuring what effect seeing an outreach programme has on those who do not actually use it there and then is difficult.

Future work

The research undertaken for this thesis formed part of a five year programme of research funded by the National Institute for Health Research (NIHR). The work in this thesis has been instrumental to the design and conduct a pilot randomized controlled trial of testing in football clubs (the SPORTSMART study). Below is a brief summary of the trial design and preliminary data. The study protocol is included in the appendix.

The Sportsmart study is a cluster randomised controlled trial exploring the uptake of three methods of promoting STI testing: popular opinion-led promotion, sexual health professional-led promotion and poster-led promotion. Six clubs were recruited and two clubs allocated to each of the three intervention arms.

Clubs were eligible to take part if they had access to toilet facilities, private changing rooms and a minimum of two teams of men ages over 18 years and at least one man who was willing to act as a popular opinion leader to deliver STI testing promotion to his team mates. The study was conducted over a period of three months from February to April 2013.

The interventions were delivered at home matches. Posters for Chlamydia testing were put up in all participating clubs and test kit collection boxes were placed in the changing rooms. In the popular opinion leader arm, the captain delivered a standardised three minute testing promotion talk and then handed a test kit to each of the players. The same talk was delivered by a sexual health advisor in the health professional-led promotion arm before test kits were handed to all players. In the poster-led promotion arm players were free to read posters and take testing kits if they wanted one. Test kits could be used and left at the club for collection or posted directly to the hospital for processing. Results were sent by text to the participant.

One hundred and fifty three men received an intervention and 90 accepted the offer of screening (59%, 95% confidence interval 35 to 79%). Acceptance rates were similar across all three study arms: popular opinion leader-led 50%, health

professional-led 67%, poster-led 61%. All test kits were used and returned on the day of the intervention with no men choosing to return a kit by post. No infections were detected.

The pilot suggests that Chlamydia testing in football clubs is acceptable and feasible regardless of how the test is offered. Interestingly, the overall uptake was around 50% which was predicted by the results of the national stratified randomised probability survey in chapter 4. More in depth analysis including cost effectiveness analysis of the public health impact of offering screening in this setting is ongoing.

Picture of testing kit box:

The research findings suggest that more work should be done to understand how best to use general practice settings as venues for accessing test kits. A mixed

method approach would be well suited for this with qualitative interviews with key stakeholders being performed before a pilot trial of testing in general practice. A purposive sample of GPs, commissioners and patients would highlight any key themes to be considered in the design of the pilot. Robust economic evaluation should be included to help with interpreting the value of using general practices in increasing chlamydia testing among men. Included in this would be diagnostic rates to ensure sufficient Chlamydia diagnoses as well as high testing rates.

Further work using non-traditional settings may also be valuable. However, the findings from the interviews suggest that interventions do not need to be costly or particularly complex in order to encourage testing. Testing opportunities should be available to men which have a minimal impact on their daily activities. Messages can be short and simple. The use of expensive health care professionals to deliver these interventions is probably unnecessary although having some process in which testing kits are delivered into the hands of men could overcome barriers associated with stigma and embarrassment.

Closing statement

The findings from the studies in the thesis suggest that men are willing to engage with chlamydia testing. Many have already done so and would value opportunities to access testing which avoid the need to take time off work or away from recreational activities. Minimising the impact that testing has on daily activities could encourage more men to test. Inventing novel testing pathways which use non-healthcare settings in order to test more men seems like an unnecessary

expense when the majority of men access general practice every year and find those settings the most acceptable in which to pick up test kits. Indeed, the men who I spoke to expressed a desire for testing to fit in with existing routines - to be accessible at normal points of contact. To create artificial points of contact adds a layer of complexity to the process.

The fragmented way in which sexual health is provided only serves to confuse and muddle a process which should be very simple. On the other hand, increasing access to testing kits by having them available in multiple settings in which men would find themselves on a daily basis may be beneficial. Chlamydia testing initiatives which use stereotypical images of masculinity may alienate men who do not identify with, nor indeed aspire to, performing masculinity in the way they depict.

Men's desire to avoid stigmatised situations may limit the effectiveness of using peers or football team captains to promote testing. Instead, there is a preference for ensuring that testing options are simple and straightforward. Expanding testing in general practice seems, to me, to be the obvious and most simple answer to the 'problem' of testing more men.

To say that all men are hard to reach is reductionist and relies too heavily on assumptions about behaviour which is drawn from comparisons to hegemonic masculinity. Men are a heterogenous group, some of whom may be difficult to engage. However, for the majority, their sexual health is important to them and it

is the way in which these services are delivered which limits testing rates. Perhaps we should reframe the way in which the problem is viewed. Instead of saying that men are hard to reach we should say that it is the optimum level of chlamydia testing which is hard to deliver. Significant opportunities already exist to increase testing rates within existing healthcare settings and men appear to be willing to use them. As healthcare providers and public health experts we should avoid the knee-jerk reaction to develop new and "innovative" models of care without first ensuring that proposed services are acceptable to users and maximising the potential of what we already have.

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APPENDICES

Summary of *M. genitalium* treatment studies

Jernberg et al 2008 (Jernberg, Moghaddam *et al.* 2008)

		Cure rate
Azithromycin	1g stat First line n=232	79%
	1g stat weekly x2 First line n=46	74%
	500mg D1 250mg D2-5 First line n=117	78%
	500mg D1	34%

	250mg D2-5 Second line n=32	
Ofloxacin	200mg BD 10/7 First line n=9	44%
	200mg BD 10/7 Second or third line n=46	58%
Moxifloxacin	400mg OD 7/7 First to fourth line n=32	100%

Bradshaw et al 2006 (Bradshaw, Jensen *et al.* 2006)

		Cure rate
Azithromycin	1g stat First line n=32	72% (55-85%) M only
	1g stat weekly x3 Second line n=2	0%
Moxifloxacin	400mg OD 10/7 Second to fourth line n=32	100%

Bradshaw et al 2008 (Bradshaw, Chen *et al.* 2008)

		Cure rate

Azithromycin	1g stat First line n=191	84% (77-90%) m+f
Moxifloxacin	400mg OD 10/7 Second line n=19	100%

Bjornelius et al 2008 (Bjornelius, Anagrius *et al.* 2008)

		Cure rate
Azithromycin	1g stat	85% (69-94%) m
	First line	88% (64-99%) f
	n=56	
	500mg D1	96% (85-99%) m
	250mg D2-5	100% (54-100%) f
	Second line after Doxy	
	n=53	
Doxycycline	200mg D1	17% (9-27%) m
	100mg D2-9	37% (19-58%) f
	First line	
	n=103	
	100mg BD 15/7	50%
	Second line after Azithro	

	n=4	

Mena et al 2009 (Mena, Mroczkowski *et al.* 2009)

		Cure rate
Azithromycin	1g stat First line n=36	87%
Doxycycline	100mg BD 7/7 First line n=42	45%

Stratified random probability sample survey questions

The program will need to compute whether respondent is eligible to complete this module or not.

Eligible respondents are all males aged 18 – 34 (inclusive).

If eligible then ask the following:

ICASI

INTERVIEWER: READ OUT TO ALL:

The next questions are for you to answer yourself using the computer. The computer is very easy to use.

Some of the questions are quite personal and, this way, your answers will be completely confidential and I won't see them. When you have finished, the whole section will get automatically locked up inside the computer so that I can't look back at it.

1 Continue

SCAccept

INTERVIEWER CODE:

1 Respondent accepted CASI

2 CASI to be asked face to face by interviewer

3 Respondent refused CASI

IF (SCAccept = Accept) THEN

InPrac

It is very important that you answer honestly and accurately so please take your time.

Before you start I will show you how to enter your answers into the computer.

INTERVIEWER: Press 1 and Enter, then turn the screen to the respondent and let them enter their answers while you observe and help if necessary.

1 Continue

CASIPra1

Have you used a computer before?

Please choose one answer.

Press the number next to the answer you want to give then press the key with the red sticker to move on.

1 Yes

2 No

CASIPra2

Which of these do you have in your home?

This time you can choose more than one answer if you want.

After each answer you need to press the space bar (the large bar at the bottom of the keyboard).

When you have given all of your answers, press the key with the red sticker to move on.

1. TV
2. Radio
3. Washing machine
4. Dishwasher
5. Computer
6. Microwave

CASIPra3

How many times have you visited the cinema in the last 4 weeks?

Type in a number using the number keys, then press the key with the red sticker to move on.

Type in 99 for ‘don’t know’.

CASIPra4

Name one of your favourite TV programmes.

This time you can type in your answer using the letter keys. Once you have typed in your answer press the key with the red sticker to move on.

EndPrac

"That is the end of the practice questions. Now please answer the next set of questions by yourself.

If at any point you would like to change your answers you can go back to previous questions using the arrow keys. There will also be a chance to make changes at the end. If you need any further help or explanations, do ask the interviewer.

Press <1> and <enter> to move on. "

4	Have you ever been tested for a sexually transmitted infection?	1. Yes 2. No

	If Yes: When was that?	1. Less than 1 month ago 2. More than 1 month but less than 6 months ago 3. More than 6 months but less than 1 year ago 4. More than 1 year but less than 5 years ago 5. More than 5 years ago 6. Other –FREE TEXT: PLEASE STATE WHEN

	If yes at Q4: Where were you (last) tested? Please choose one answer from the list	1. General practice (GP) surgery 2. Sexual health clinic (GUM clinic) / Brook 3. NHS Family planning clinics/ contraceptive clinic/ reproductive health clinic 4. Private non-NHS clinics or doctor 5. A test you collected from Pharmacy/ chemist 6. A test you collected from internet 7. A test you collected from somewhere else (FREE TEXT – PLEASE STATE WHERE) ***8.*** Youth centre 9. Hospital accident and emergency (A&E) department

10. NHS walk-in centre
11. University or college health centre / campus
12. Somewhere else (FREE TEXT – PLEASE STATE WHERE)

5	Have you ever had a blood test for HIV (the virus that causes AIDS)?	1. Yes 2. No
	If Yes: When was that?	1. Less than 1 month ago 2. More than 1 month but less than 6 months ago 3. More than 6 months but less than 1 year ago 4. More than 1 year but less than 5 years ago 5. More than 5 years ago 6. Other –FREE TEXT: PLEASE STATE WHEN
	If yes at Q5: Where were you (last) tested? Please choose one answer from the list	1. General practice (GP) surgery 2. Sexual health clinic (GUM clinic) / Brook 3. NHS Family planning clinics/ contraceptive clinic/ reproductive health clinic 4. Private non-NHS clinics or doctor 5. Internet site offering postal kit 6. Youth centre 7. Hospital accident and emergency (A&E) department 8. NHS Walk-in centre 9. University or college health centre / campus Blood donation

centre

10. Somewhere else (FREE TEXT – PLEASE STATE WHERE)

6	In the last year how many sexual partners have you had? This is for oral, and or vaginal and or anal sex	Type in the number in the last year, Type '0' if none
	If Q6 <> 0: How many of these sexual partners were in the last 3 months?	Type in the number in the last 3 months, Type'0' if none
7	Was a condom used on any occasion of having vaginal or anal sex with your sexual partners in the last 3 months?	1. Every time **2.** Sometimes 3. Not at all in the last 3 months
8	Thinking about the last person you had sex with, were they male or female?	1. Male 2. Female

3	Many sexually transmitted infections (STI) can be tested for from urine samples. HIV (the virus that causes AIDS) can be tested for using a cotton wool mouth swab. Both of these can be done using kits supplied by the NHS, which are then posted back to the hospital for testing. Testing kits can be left in a variety of places and picked up without the need to ask for one. Results can then be emailed, texted or accessed online with secure logins. All of this is free. We are interested in your opinion of this as an option for STI and HIV testing.
If you wanted a test for STIs in the future, would you be willing to provide a urine sample to send for STI testing?	1. Yes 2. No (FREE TEXT – IF NO WHY NOT?)
If you wanted a test for HIV in the future, would you be willing to send a mouth swab for HIV testing?	1. Yes 2. No (FREE TEXT – IF NO WHY NOT?)
If Yes to EITHER THEN We want to find the best places to make these kits available. If you wanted a test for STIs or HIV in the	1. School 2. College/ University campus 3. Workplace 4. Youth club 5. General practice (GP) surgery

future, which of the following would be acceptable to you as pick-up points for the kits? Please choose all answers that apply from the list After each answer press the space bar (the large bar at the bottom of the keyboard). When you have given all of your answers, press the key with the red sticker to move on.	6. Sexual health clinic (GUM clinic) 7. Pharmacy/ chemist 8. Bar/ pub/ nightclub 9. Gym 10. Sports club (for example tennis club/ football club/ cricket club) 11. Recreational/ leisure/ sports centre/ swimming pool 12. Coffee shop/ Cafe 13. Sent to me in the post 14. Other (FREE TEXT – PLEASE STATE WHERE)

9	Have you taken part in any sporting or recreational physical activity in the last 4 weeks?	1. Yes 2. No
	If Yes: Please indicate which activities you took part in: Please choose all answers that apply from the list After each answer press the space bar (the large bar at the bottom of the keyboard). When you have given all of your answers, press the key with the red sticker to move on.	1. Swimming 2. Cycling 3. jogging 4. Athletics 5. Gym/ Health club 6. Football 7. Tennis 8. Rugby union 9. Rugby league 10. Basketball 11. Boxing 12. Badminton 13. Cricket 14. Rowing 15. Hockey – field 16. Martial arts eg judo, kick boxing, Tae Kwondo, karate 17. Other (FREE TEXT – PLEASE STATE WHERE)
	Thinking about (EACH	1. Every day

	SELECTED ACTIVITY IN TURN), on how many occasions have you taken part in this activity in the last month? REPEAT FOR EACH	2. Not every day but more than once a week 3. Once a week 4. Less than once a week but more than once a month 5. Once a month

10 Thinking about recreation centres, sports clubs, gyms and other places you may play sport (we want to ask all participants this whether they said yes or no to Q7)

Would you find it acceptable to pick up a urine testing kit for STIs in these places?	1. Yes 2. No

Would you find it acceptable to pick up a mouth swab testing kit for HIV from that location?	1. Yes 2. No

1	Are you registered with a general practice (GP) surgery?	1. Yes 2. No

2	Have you been to your GP in the last 12 months?	1. Yes 2. No

EndCASI1

"That was the last question for you to answer on the computer yourself.

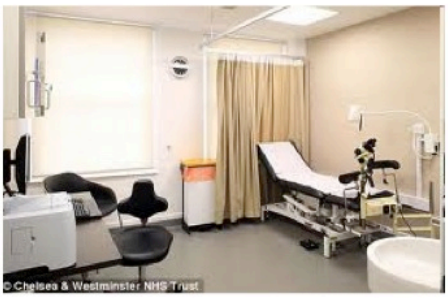
Thank you very much for answering these questions.

Please now type 1 and press <ENTER> (This will lock-up your answers)

EndCASI2

Now please hand the laptop back to the interviewer.

Flow charts of proposed testing models



Attend sexual health clinic or GP to see a doctor or nurse

Self collected urine test to test for infections which is left at the clinic/ GP

Test result is sent to your phone and options for any treatment necessary is explained

Coach delivers short talk about why it is important to test for sexual infections

Self collected urine test kits are left at the club for men to take away and use

Urine test is posted to the hospital for testing

Test result is sent to your phone and options for any treatment necessary is explained

Doctor or nurse visits the clubs to give a short talk about why it is important to test for sexual infections

Self collected urine test kits are left at the club for men to take away and use

Urine test is posted to the hospital for testing

Test result is sent to your phone and options for any treatment necessary is explained

Posters and leaflets about testing for sexual infections are left at the club

Self collected urine test kits are left at the club for men to take away and use

Urine test is posted to the hospital for testing

Test result is sent to your phone and options for any treatment necessary is explained

Interview participant information leaflet

Research participant information sheet

Study Title:

Exploring the acceptability of using football coaches as popular opinion leaders to promote sexually transmitted infection screening of young men in sport settings.

Introduction

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you.

This information sheet tells you about the purpose of this study and what will happen to you if you take part as well as more detailed information about the conduct of the study.

If you wish, one of our team will go through the information sheet with you and answer any questions you have. Talk to others about the study if you want to.

Please ask us if there is anything that is not clear.

What is the purpose of the study?

Many people with sexually transmitted infections (STI) do not know that they are infected because they do not have any symptoms. Younger men and women are most at risk of STIs.

The most common way for men to test for STIs is for them to attend a hospital clinic and see a doctor or nurse for tests but many men are reluctant to do this.

For these reasons we are trying to find new ways of reaching young men who may be at risk of STIs and to encourage them to have a test for STIs. To do this we need to find out what young men think about being offered sexual health checks by people other than doctors and nurses in non health care settings.

In particular we want to know if men who play football as part of a club would find it acceptable to have football coaches tell them about the benefits of testing for STIs and to pick up testing kits from the club.

It is hoped that findings from this research will allow us to develop better and more acceptable ways to encourage younger men to test for sexually transmitted infections.

Why have I been invited?

We want to talk to men aged between 18 and 35 who play football as part of a club team. We are expecting to have about 20 men take part in the research study.

Do I have to take part?

Taking part is voluntary; it is up to you to decide whether or not to take part.

If you choose not to take part there won't be any disadvantages for you.

If you agree to take part, you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time, without giving a reason.

What will happen to me if I take part?

We would like you to take part in a face-to-face interview lasting between 25 and 40 minutes. The researcher will ask for your opinions about using football coaches to encourage men to pick up STI testing kits in football clubs. The interview will take place in a private room at the training grounds or other private place that is convenient for you.

The information you give in the interview is important and so the researcher can remember what has been said, with your permission, it will be audio taped. The interviews are confidential and only accessible to the research team.

These interviews will be typed up with any personal details removed so that it will not be possible to identify you by reading the interview. You will be given an identification number. If you wish to withdraw your interview from the research you can call the researcher and quote this number. The researcher will then be able to identify which interview is yours and remove it from the study.

To compensate you for any travel expenses and for your time we will be giving you £20 for taking part in this research.

Will anyone know what I have said in the interview?

This interview is confidential. All information which is collected about you during the course of the research will be kept strictly confidential. Any information you supply will have your name removed from it so that you cannot be recognised from it. The researcher will treat the information you give as confidential. This means that they can't tell anyone what you have told them.

What are the possible benefits of taking part?

The interview will give you a chance to have your say and tell us what you think about access to STI screening tests. We are hoping that is will be possible to use the results to help us develop easier and more acceptable ways for young men to access screening tests for STIs.

What will happen to the results of the research study?

We will be using the results from the interviews to give us ideas about how to change the way we offer STI testing to young men. We hope this will lead to an improvement in the choices on offer and the overall sexual health of young men.

In the future we will be testing some of these ideas to see if they work. Some results will also be published in journals and presented at scientific

meetings. You will not be able to be identified in anything that is published or presented.

Who is organising and funding the study?

This research is being funded by the National Institute for Health Research (NIHR), part of the Department of Health. It is being organised by researchers from Barts and The London School of Medicine and Dentistry at Queen Mary University of London.

Who has reviewed the study?

This research has been reviewed by the Queen Mary University of London Ethics committee.

If you would like further information please contact:

John Saunders

Researcher

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Email: j.saunders@qmul.ac.uk

Thank you for taking part in this research study.

Interview topic guide

The Sportsmart Study

Aims and Objectives
The overall aim of this study is to explore the acceptability of using football coaches as popular opinion leaders to promote sexually transmitted infection screening of young men in sport settings.
Introduction

Aim: To introduce the research and set the context for the proceeding discussion.
 	
• Introduce self
• Introduce the study: who it is for; what it is about
• Talk through key points:
  - Purpose of the interview
  - Length of the interview
  - Thank you payment
  - Reasons for recording the interview
  - Confidentiality and reporting of findings
• Any questions participant may have

1. Background and personal circumstances - BRIEF

Aim: To introduce the participant and to highlight any key background issues that might influence how acceptable they find the proposed screening model.

- Age; household circumstances (whether they live alone or with others)
    - Relationship with,
    - Their age,
    - Activity
- Main daytime activity (whether in work or not; details of work)
- Other interests/ activities (spare time)

2. Football club

Aim: To understand why the participant is involved in the club and what they gain from their involvement.

- Involvement in football club
    - How they became involved
    - Length of time with the club
    - Purpose of involvement with the club
        - recreation;
        - health;
        - community;
        - socialising etc
    - Position played on team
- Relationships within the club
    - With other players
    - "Officials"

        - Coach
        - Committee
    - Types of interactions
        - Just sport
        - Talking (about what?)
        - Socialising (outside of the club setting)
- Thoughts on using club to deliver health promotion
    - Is this an acceptable setting to deliver health messages?
        - General health/ diet/ exercise/ obesity/ smoking etc
    - What about sexual health messages?
- Thoughts on using coaches to deliver health promotion
    - Is this an acceptable way to deliver health promotion?
    - Is it appropriate to discuss health with coaches?
    - What about sexual health?
- Thoughts on having health specialist enter the club to deliver health promotion
    - Is this an acceptable way to deliver health promotion?
    - Doctor versus nurse
    - Is it appropriate to discuss health with HCPs in the club?
    - What about sexual health?
- Thoughts on having leaflets and posters in the club setting to promote health
    - Is this an acceptable way to deliver health promotion?
    - What about sexual health?
- When to deliver messages – and how to deliver it (formal/ informal)

3. Acceptability of different sexual health promotion models

Aim: To explore the acceptability of delivering sexual health screening in different ways (use picture flow charts to aid discussion)

Describe Model 1 (Traditional/ Clinic/ GP)

What are your initial thoughts about testing for STIs in this way?

- Why do you think that?
- Probe/ expand

Go through each step of that model:

- Attending the clinic:
    - What are the advantages?
        - See a HCP
        - Quality of service/ advice
        - Anonymous – unlikely to see someone you know
        - Professional
        - Full screens (inc HIV/ STS)
    - What are the disadvantages?
        - Waiting times
        - Clinic times/ away from work
        - Embarrassment
        - Fear
    - What are the barriers to this screening method?
        - Waiting times
        - Clinic times/ away from work
        - Embarrassment
        - Fear
    - What would motivate you to attend a clinic?
        - Symptoms
        - Partner request
        - Particularly concerned about sexual encounter

- Self collected urine test (***vs. swab test – put urine into context and only for CT infection***):
    - What are the advantages?
        - Self collected
        - No need for examination
        - No invasive test (umbrella)
        - Easy
        - Quick
    - What are the disadvantages?
        - Accuracy
        - Only CT/ GC test

- Text message result (***only for CT infection***):
    - What are the advantages?
        - Always get your results
        - Personal/ confidential
        - Result to show partners
    - What are the disadvantages?
        - Might be seen by someone
        - Intrusive

Describe Model 2 (Coach led, club based promotion)

What are your initial thoughts about testing for STIs in this way?

- Why do you think that?
- Probe/ expand

Go through each step of that model:

- Receiving promotion message from coach:
    - What are the advantages?
        - Someone you know
        - Less embarrassing
        - No need to go to a clinic
    - How much information do you think you would need to have about the benefits of testing to encourage you to test?
        - None – just get coach to tell us to test
        - A little
        - A lot
        - Etc/ why why why?
    - What are the disadvantages?
        - Someone you know
        - More embarrassing
        - Intrusive
    - What are the problems with this method?
        - As above
        - At the club to play football not have lecture
    - What would encourage you to test in this way?
        - Peers
    - What would discourage you to test in this way?

- How does this compare to going to the clinic/ GP?
    - Better or worse? Why?

- Self collected urine test kits left at club:
    - What are the advantages?
        - Self collected

        - No need for examination
        - No invasive test (umbrella)
        - Easy
        - Quick
    - What are the disadvantages?
        - Where would you leave them?
        - Someone might see you
    - How should they be distributed?
        - Handed out
        - Left for collection
        - Etc
        - Why?
    - Where should they be left (if this is a viable option)?
        - Changing room
        - Toilets
        - Bar
        - Handed out
    - What should they look like?
        - Bland/ brown bags
        - Club colours
        - PL branding
    - When should the test be done?
        - Pre training
        - Post training
        - Somewhere other than the training site (home etc)
        - Why?
    - Suggestions/ comments about the labelling process
        - Is this likely to be a problem?

        - Why?

- Posting kits to hospital:
    - What are the advantages?
    - What are the disadvantages/ problems?
        - Fear of leaking
        - Lost in post
        - Time to get to hospital/ knock on effect on results

- Text message result (as before):
    - What are the advantages/ disadvantages?

Describe Model 3 (HCP led, club based promotion)

What are your initial thoughts about testing for STIs in this way?

- Why do you think that?
- Probe/ expand

Go through each step of that model:

- Receiving promotion message from HCP:
    - What are the advantages?
        - Professional
        - Knowledge
        - Anonymous
    - What are the disadvantages?
        - Intrusive
        - Embarrassment
    - What are the problems with this method?
        - As above

        - At the club to play football not have lecture
    - What would encourage you to test in this way?
        - Peers
    - What would discourage you to test in this way?
- How does this compare to going to the clinic/ GP/ Coach led?
    - Better/ worse/ why?

Describe Model 4 (Poster led, club based promotion)

What are your initial thoughts about testing for STIs in this way?

- Why do you think that?
- Probe/ expand

Go through each step of that model:

- Receiving promotion message from Poster:
    - What are the advantages?
    - What are the disadvantages?
    - What would encourage you to test in this way?
    - What would discourage you to test in this way?
- How does this compare to going to models 1-3?
    - Better/ worse/ why?

What do you think are the advantages of accessing screening in the football club?

- Easy
- Accessible
- No appointment/ quicker
- Non invasive
- No examination/ no need to see HCP

- Free
- Less stigma vs. more stigma?
- Others?

What do you think are the disadvantages of accessing screening in the football club?

- Coach not an expert
- No d/w HCP
- Concern about test accuracy
- Observed taking test/ test seen by others at home/ in the club etc
- Others?

Can you put these into the order in which you would prefer to test for STIs? (Participant puts picture sheets in order of preference) (Read out the order and ask why they have done this order)

4. Observability

What impact does the possibility of seeing someone take a test or being seen to take a test impact on the likelihood of testing?

Would you be more of less likely to take a test if you saw a team member take one?

Would you discuss the test with team members?

5. Identifying an opinion leader

Which members of the club do others go to for:

- General advice
- Health advice
- Personal advice
- Sex advice?

Why?

Which member of the club would be best to talk about why to test?

Coding tree

1. Demographics

Age

Employment/ occupation

Relationship

Football history (length played/ team/ position/ reason for playing)

Ranking of options

Previous STI test/ diagnosis

2. Health Promotion

A. Sexual health promotion

B. Non-sexual health promotion

2.1 General attitudes & feelings

2.2 Alignment of message and reason for playing football

2.3 Time until behaviour impacts on health

2.4 Who is the message appropriate for?

2.5 Other

3. Delivery of the message

A. Coach

B. HCP

C. Poster

D. Other

3.1 When to deliver the message

3.2 Characteristics of the deliverer

3.3 How to deliver the message

3.4 Content of the message

3.5 General attitudes & feelings about the delivery method

3.6 Other

4. The STI testing kit

4.1 Appearance of testing kit

4.2 Distribution of testing kits (before kit is in the hands of the user)

4.3 Use of testing kits (after kit is in the hands of the user)

4.4 Return of testing kits

4.5 General attitudes & feelings about STI testing

4.6 Comments about text messages

4.7 Other

Interview Participant characteristics

Nineteen interviews were conducted over a period of almost four months. The first two were pilot interviews, only one of which is included in the data analysis. Demographic details of participants is given below in table x and y.

Ethnicities	White British	15
	White European	2
	British Asian	1
	Chinese	1
Age ranges	18-24	4
	25-29	10
	30-35	4
	>35	1 (Pilot 1 - excluded from analysis)
Team positions	Captain/ Committee/ Coach	6
	Player	13

Interview number and date conducted	Brief details of participant	
1: 25th August 2011	36 year old, White British, MSM	[001_250811 36yo, White British, MSM]

[Pilot 1]	5 a side football, no longer playing Interviewed at their home	
2: 1st October 2011 [Pilot 2]	34 year old, White British, MSM LGBT football league Interviewed at their home	[002_011011 34yo, White British, MSM]
3: 26th October 2011	34 year old, White British, Heterosexual 2nd Team Interviewed at place of work	[003_261011 34yo, White British, Heterosexual]
4: 27th October 2011	34 year old, White British, Heterosexual Club social secretary Interviewed at their home	[004_271011 34yo, White British, Heterosexual]
5: 1st November 2011	20 year old, White British, Heterosexual 8th and 9th Teams	[005_011111 20yo, White British, Heterosexual]

	Interviewed in park	
6: 1st November 2011	26 year old, White British, Heterosexual 5th Team Interviewed at their home	[006_011111 26yo, White British, Heterosexual]
7: 3rd November 2011	27 year old, White British, Heterosexual Club social secretary Interviewed at their home	[007_031111 27yo, White British, Heterosexual]
8: 3rd November 2011	28 year old, White British, Heterosexual Team captain Interviewed at their home	[008_031111 28yo, White British, Heterosexual]
9: 5th November 2011	28 year old, White British, Heterosexual Team secretary and ex-captain Interviewed at football club	[009_051111 28yo, White British, Heterosexual]

10: 15th November 2011	27 year old, White British, Unknown Team captain Interviewed at their home	[10_151111 27yo, White British, Unknown]
11: 5th December 2011	22 year old, White European, Heterosexual Ex-professional Interviewed at their home	[11_051211 22yo, White European, Heterosexual]
12: 7th December 2011	26 year old, White British, Heterosexual Centre forward Interviewed at research offices	[12_071211 26yo, White British, Heterosexual]
13: 8th December 2011	26 year old, White British, Heterosexual Midfield Interviewed at research offices	[13_081211 26yo, White British, Heterosexual]

14: 9th December 2011	22 year old, White British, Heterosexual Centre Back Interviewed at their home	[14_091211 22yo, White British, Heterosexual]
15: 10th December 2011	31 year old, White British, Heterosexual Married with child Interviewed at their home	[15_101211 31yo, White British, Heterosexual]
16: 11th December 2011	28 year old, White British, Heterosexual Ex-coach Interviewed in a cafe	[16_111211 28yo, White British, Heterosexual]
17: 13th December 2011	24 year old, British Asian, Heterosexual Interviewed at research offices	[17_131211 24yo, British Asian, Heterosexual]
18: 17th December 2011	28 year old, White European, Heterosexual Interviewed in their home	[18_171211 28yo, White European, Heterosexual]

19: 17th December 2011	29 year old, Chinese, Heterosexual, Interviewed at their home	[19_171211 29yo, Chinese, Heterosexual]

Sportsmart study protocol

Development and evaluation of the disease control potential of a model for testing young men at high risk of STI in a sports setting:

The *SPORTSMART* pilot trial.

Aim: To undertake a feasibility pilot and evaluation of two STI screening (Chlamydia and Gonorrhoea) interventions among men in different amateur football clubs in the greater London area.

Specific objectives:

- to determine the acceptability and feasibility of football trainer-led STI screening (Chlamydia and Gonorrhoea) to young men
- to undertake a feasibility pilot and evaluation of football trainer-led STI screening in two contrasting football clubs in different geographical areas
- to determine the uptake of STI screening by young men in football club settings
- to obtain cost data for the football trainer-led STI screening strategies to use in preliminary economic evaluation

Background

For this type of intervention to be effective in young men, the choice of setting needs to reflect both a high uptake (popular) sport *and* opportunities for a linked network of clubs/leagues with strong managerial support to ensure generalisability and sustainability beyond the pilot.

Findings from the Sport England Active People Survey[12] suggest that football is the highest participation team sport in England and 13.4% of adult men play football at least once a month**.** 5% (470,000) of men in England (16-44) play in Football Association affiliated leagues and competitions (www.thefa.com) and organisations exist to encourage young people from disadvantaged backgrounds to become involved in the sport. These organisations have already shown strong support for this proposal. Via preliminary qualitative research undertaken in similar settings, we believe that the amateur football club setting will be feasible for the *SPORTSMART* interventions.

Pre-clinical findings

Prior research included a theoretical "pre-clinical" stage to explore relevant theory and determine the type of intervention required. The "pre-clinical" preparatory work explored the theoretical and strategic issues involved in delivering STI & HIV screening in football settings. This work began with a literature review, and included both formal and informal discussion with leaders and players in a range of community-based sporting bodies and sports clubs (Clubs that Count, Business in The Community (*www.bitc.org.uk*), Sporting Equals (*www.sportingequals.com*), East London Bangladeshi Football League, BBC SPORT's Your Game (*bbc.co.uk/yourgame*), Football Association (FA),

consultation with local PCT commissioners, and clinical experts at the testing centres and sexual health services who will be responsible for clinical follow up of positive cases.

Formal qualitative interviews with stakeholders and men who would potentially receive the intervention took place in 2011. This preliminary work included a purposive sample of 18 football players aged 18-30, and trainers and community sports organization representatives from a range of demographic and risk backgrounds recruited through our community group research collaborators' networks. Formal qualitative thematic analysis of data indicated general acceptability of offering STI screening in amateur football clubs. This initial qualitative work strongly suggested key methodological considerations including that the coaches who would be responsible for delivering the intervention would not be interested in receiving or delivering comprehensive sexual health training and that the testing promotion interventions be as brief as possible in order to improve players' test uptake.

Methods:

Study design

Our research follows The Medical Research Council framework of five stages in the development and evaluation of RCTs for complex interventions to improve health.

Study setting

Feasibility pilots will be conducted in six amateur football clubs within the greater London area, recruited through our community partners network.

Overview:

The SPORTSMART pilot is a cluster randomised, three arm, pilot randomised controlled trial (RCT) with three phases of research that follow sequentially: the intervention; a brief anonymous survey; qualitative semi-structured interviews.

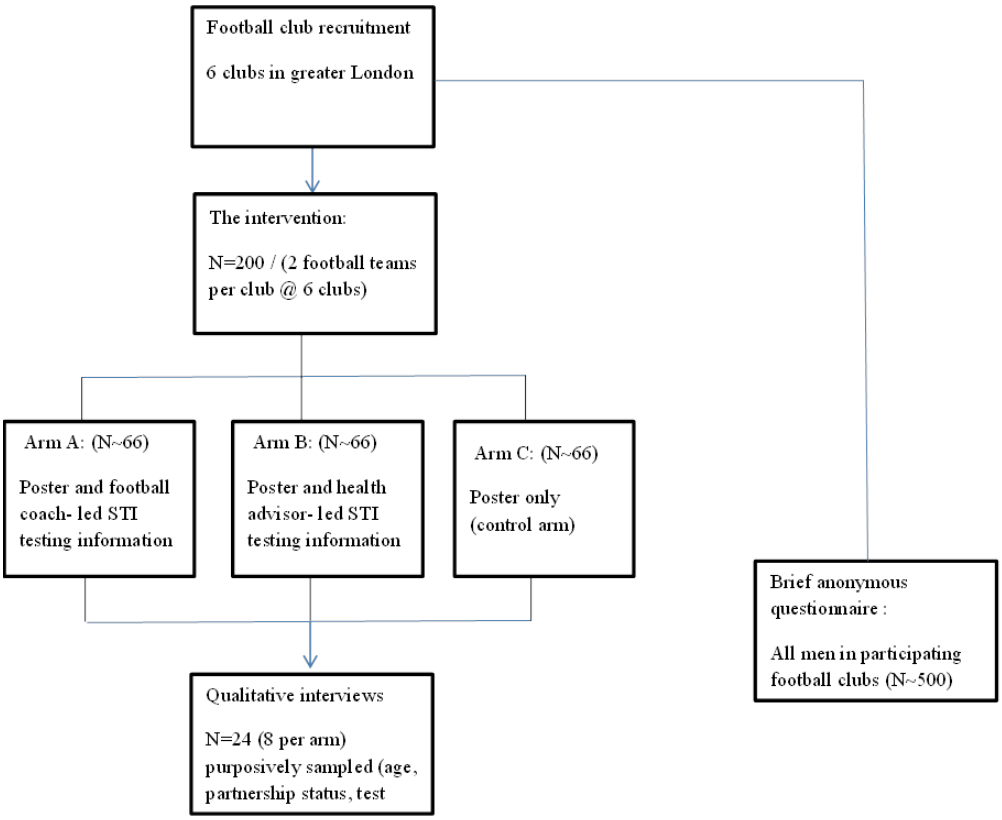

Figure 1: Participant flow in SPORTSMART Pilot Trial

Interventions

The feasibility study provides an opportunity to compare the feasibility and acceptability of the two candidate interventions developed in the initial qualitative stage of research compared with control clubs (STI testing information supplied on a poster).

The interventions will be:

- **Intervention 1: Football coach promoted screening:** Football coach provides players a brief explanation of STI screening and distributes urine sample kits for Chlamydia and Gonorrhoea screening. Posters promoting testing and instructions on how to complete the test kit are posted in club changing room. Players provide urine sample and drop off the kit in a special sealed box for collection or post it directly to Barts Sexual Health Centre for patient registration and sample testing. All results and clinical management will be undertaken by Barts Health clinical team.

- **Intervention 2: Sexual health care professional promoted screening:** Sexual Health professional provides players a brief explanation of STI screening and distributes urine sample kits for Chlamydia and Gonorrhoea screening. Posters promoting testing and instructions on how to complete the test kit are posted in club changing room. Players provide urine sample and drop off the kit in a special sealed box for collection or post it directly to Barts Sexual Health Centre for patient registration and sample testing. All results and clinical management will be undertaken by Barts Health clinical team.

- **Control: Poster-promoted screening:** Posters promoting testing and instructions on how to complete the test kit are posted and testing kits are placed in club changing room. Players provide urine sample and drop off the kit in a special sealed box for collection or post it directly to Barts Sexual Health Centre for patient registration and sample testing. All results and clinical management will be undertaken by Barts Health clinical team.

Anonymous questionnaire

After the intervention all players in clubs selected for the intervention will be invited to self-administer a short paper questionnaire. This anonymous questionnaire will request demographic and sexual behaviour data including number of sex partners and condom use with different partners. This will allow us to determine whether *SPORTSMART* provides an opportunity of accessing men at higher risk of STIs.

Qualitative individual in-depth interviews

We will also invite 24 players to take part in a semi-structured individual in-depth interview after the intervention. Players will be invited to interview based on a purposive sample including age, partnership status, and if they decided to take part in the intervention or not. The qualitative data from these interviews will provide user-perspectives on the acceptability of the intervention and testing protocol.

Intervention allocation and randomisation

We will implement one intervention in each of the six clubs. Each intervention will be delivered once within an eight month time period.

We will randomize the six clubs in London to the three interventions. Clubs will first be matched based on geographic area and club membership size. Matched clubs will be given a joint number and those 3 numbers will be randomly allocated to each study arm in turn.

Sample size

This will be a community sample of men ages 18-35 who are players in six amateur football clubs in greater London. We expect to include N~500 men total. N~500 will be invited to the survey phase, of which n=200 men will be included in the intervention. Of those n=200 included in the intervention we expect n=24 to participate in a semi-structured interview.

If 200 men and 50% uptake screening, then we will be 95% confident that the 'true' uptake rate is between 43%-57% However, if uptake is lower, e.g. 15%, then we will be 95% confident that the 'true' uptake rate is between 10%-20%.

Eligibility criteria

Intervention: Playing members of the club who are between 18 – 35 years of age, inclusive. Survey: All men who are playing or non-playing members of the club and who are over 18 years of age will be invited to participate. Qualitative interviews: All men who have received the intervention, regardless of their decision to take up the offer of STI screening or not.

Clinical care pathways and management of samples:

Ethical note: The role of football trainers will be as **promoters** of STI screening

Men who elect to test as part of the SPORTSMART study will be registered as patients of the sexual health clinic at Barts Health and have their results sent via text message which is the routine clinical management system at Barts. For those patients who test positive for Chalmydia and/or Gonorrhoea, their treatment and follow up care will follow the routine clinical management pathway of the Barts Sexual Health Centre.

The intervention:

Two teams in each of the six football clubs who have agreed to participate will receive one intervention. We expect approximately 200 young men within the six clubs to receive one of the three arms of the intervention. Two clubs will be allocated to each of three intervention arms: **football coach promoted screening; sexual health care professional promoted screening; poster-promoted screening.**

In each of the three arms of this pilot trial men will be invited to self-complete STI kits for Chlamydia and **Gonorrhoea screening. These test kits will consist of:**

1. **1 urine sample tube and corresponding transporter case**
2. **1 test request form**
3. **1 freepost envelope**
4. **1 participant information leaflet**

A SPORTSMART researcher or Barts Health sexual health advisor will deliver all sealed and completed STI test kits to Barts Sexual Health clinic. A Clinic-based NHS sexual health professional will register all participants who elect to test with SPORTSMART as Barts Sexual Health Clinic patients in order that they receive routine clinical care. The results delivery and health care management of these participants will follow routine patient care guidelines of the Barts Sexual Health Clinic.

Football coaches (intervention 1) and health care professionals (intervention 2) who will be delivering the promotion messages will be briefed by the trial coordinator to ensure the same message will be delivered to the potential participants.

Brief, anonymous survey:

A named study liaison at each football club will be given brief (not more than 25 questions), anonymous, self-completed questionnaires to distribute among all club members ages 18 and above. A sealed and locked box will be left at the club for participants to return the surveys. After a 1-2 week period a SPORTSMART staff person will collect the sealed box and any blank questionnaires.

The survey will provide a baseline understanding of the basic demographic profile and sexual risk of the participants in the intervention and will be a key piece of data in our understanding of the men we may be reaching with the intervention.

Qualitative interviews:

Participants in the intervention will be invited by football club staff to provide their contact information in order to be considered for inclusion in qualitative, individual, semi-structured interviews. Men who agree to provide contact information will be entered into a purposive sample frame such as depicted in Table 1, below. We will also strive to sample equal numbers of men ages18-24 and ages 25-35 involved in each trial arm. There will be 24 qualitative interviews in total.

	Tested	Declined test	Total
Arm 1	4	4	8
Arm 2	4	4	8
Arm 3	4	4	8
Total	**12**	**12**	**24**

Table 1: Purposive sampling of qualitative interview participants

Qualitative interviews will be conducted by a SPORTSMART researcher trained in qualitative methodologies. Interviews will take place either at the football club or the Barts Sexual Health centre, depending on the participants' preference. After written consent is given, all interviews will be tape recorded (digital tapes).

The purpose of these interviews is to provide insight into men's experiences with the intervention.

Evaluation: Structure, process and outcomes

The feasibility study will be used to determine the proportion of eligible men who take up the offer of STI screening and proportion of positive tests.

- The Primary quantitative outcome measure for the feasibility study is the proportion of eligible men accepting the offer of screening (uptake)
- Secondary quantitative outcome measures will include: number of positive tests per club and overall, and overall number of men who test positive and are successfully treated
- Secondary qualitative outcomes will include: factors associated with preference for and uptake of STI screening with *SPORTSMART*

Process outcomes will be collected using both quantitative and qualitative methods and will focus on assessing: 1) the extent and quality of intervention delivery; 2) the mechanism; 3) the context; 4) the response of the target group.

Intervention analysis:

We will be using the following data collected at the time of the intervention delivery:

- Football coach and health care professional feedback forms
- Number of test kits provided to players
- Number of test kits returned

After all patients have received their STI test results, (we expect this will be approximately 3-4 weeks after the interventions have been delivered), a Barts Sexual Health Care professional will provide the SPORTSMART research team with the number of positive test results per football club and the total number of positive tests received overall. No individual test results will be requested or used in this research.

Brief, anonymous survey data preparation and analysis:

A SPORTSMART researcher will input all data from questionnaires into an Access database. Statistical analyses of survey questionnaires will be performed in STATA by a SPORTSMART statistician. We expect a basic descriptive analysis; two by two tables will describe correlations between items and logistic regression will measure the degree of association between correlated items.

Qualitative interview data preparation and analysis

Digital recordings from interviews will be transcribed by a professional transcriptionist. We will analyse these transcripts using the principles of thematic analysis and follow the National Centre for Social Research 'Framework' approach, involving a structured process of 'sifting, charting and sorting material' according to key issues (Ritchie J, Spencer L. Qualitative data analysis for applied policy research. In: Analysing Qualitative Data [Bryman A, Burgess R, eds.], Routledge, London, 1994: 173-179). This will involve identifying recurring themes and concepts to make up a thematic framework, or index, which we will then apply systematically to the transcripts. Two researchers will undertake analysis, and reliability will be enhanced by double coding a subset of transcripts

and comparing inter-rater reliability. Consensus will be negotiated if discrepancies emerge.

Economic Evaluation

All cost and resource data will be collected from the SPORTSMART Pilot Trial and used to populate an economic model. The model will take the form of a decision tree and will be designed to facilitate model based comparison between interventions 1 & 2 and the control arm. The relevant cost and resource data will include:

- Average time of contact for health promotion breifing by the research team to popular opinion leaders (intervention 1) and the health care professionals (intervention 2)
- Average time of contact between opinion leaders/ health care professionals and groups of men or individual men in order to promote the screening
- Costs associated with the urine sample kit materials and informational posters.

All personnel involved in the delivery of intervention 1 and 2 will be given standardised forms to record their contact time with individuals or groups for the purpose of promoting the screening.

The model based economic evaluation will take the primary perspective of the health service and will be based on a primary outcome of cost per individual screened, with secondary outcomes including cost per positive case detected and cost per successful treatment. Sensitivity analysis will widen the perspective to

include the private costs associated with the screening. The reason for using restricted individual-level outcomes, taking a decision-tree approach, is that the main purpose of the study is to explore the feasibility of these novel alternative interventions for promoting screening in men. However, if any of these methods are shown by the feasibility study to increase uptake significantly then the impact on transmission in the population needs to be considered, to provide policy-makers with a complete evaluation of cost-effectiveness which accounts for infections averted as well as those identified and treated. To do this, we will use parameter estimates from this study to inform the transmission-dynamic model described elsewhere in this proposal. Previous work based on a transmission dynamic model has shown that that increased uptake of screening has a favourable effect on the cost effectiveness ratio.

Incremental cost-effectiveness ratios (ICERs) will be calculated where appropriate as mean difference in costs and effect. The ICERs will be presented both in terms of incremental cost per positive case detected and incremental cost per successful treatment. The uncertainty in the data used in the decsion tree model will be represented using cost effectiveness acceptability curves (CEACs) generated through the use of probabilistic sensitivity analysis. We will use sensitivity analyses to explore the robustness of these results to plausible variations in key assumptions, and variations in the analytical methods used, and to consider the broader issue of the generalisability of the results.

Impact

We expect that the SPORTSMART trial will increase the knowledge of how to better improve the sexual health of young men in the UK through piloting and evaluating the disease control potential of our models for promotion of male STI screening. This example of community-rooted involvement in STI screening and may reach men who would not otherwise use sexual health services & could provide a generalisable solution for other health promotion interventions in young men such as drug and alcohol awareness.

Public involvement has already played a key role in our program and we will continue to engage with consumers at the design, conduct & dissemination stages to enhance the quality of the research.

ORIGINAL RESEARCH ARTICLE

Is asymptomatic non-chlamydial non-gonococcal urethritis associated with significant clinical consequences in men and their sexual partners: a systematic review

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Summary: Opinions are divided on whether to screen asymptomatic men for non-chlamydial non-gonococcal urethritis (NCNGU). We systematically reviewed the literature to determine whether male asymptomatic NCNGU is associated with significant clinical outcomes for men and/or their sexual partners. We searched electronic databases and reference lists from retrieved articles and reviews. No studies reporting clinical outcomes in men with asymptomatic NCNGU were identified. Two eligible studies report rates of sexually transmitted infections (STIs) in female partners of men with asymptomatic NCNGU; *Chlamydia trachomatis* was detected in 2.4% and 8.3% of these women. The evidence available is insufficient in quality and breadth to enable us to conclude whether asymptomatic NCNGU is associated with significant health consequences for men or their sexual partners; however, clinical consequences of asymptomatic NCNGU are poorly investigated. Clinicians should be aware of the limitations of the evidence on which current screening guidelines for asymptomatic men are based.

Keywords: men, urethritis, non-gonococcal urethritis (NGU), non-chlamydial non-gonococcal urethritis (NCNGU), non-specific urethritis (NSU), asymptomatic, screening, systematic, review

INTRODUCTION

Non-chlamydial non-gonococcal urethritis (NCNGU) is a common condition that is believed to be sexually transmitted. Approximately 70,000 men in the UK receive this diagnosis each year.[1] It is characterized by microscopic findings of polymorphonuclear leukocytes (PMNLs) on urethral Gram stain in the presence (symptomatic NCNGU) or absence (asymptomatic NCNGU) of urethral discharge, dysuria, urethral itching and penile irritation in men in whom *Chlamydia trachomatis* and *Neisseria gonorrhoeae* have been excluded.

Several pathogens such as *Trichomonas vaginalis*, *Herpes simplex* virus and adenovirus have been linked with NCNGU but recent interest has focused on *Mycoplasma genitalium*, which accounts for between 10% and 46% of cases of NCNGU.[2,3] *M. genitalium* appears to be associated predominantly with symptomatic presentations[4–7] and although associations have been reported with a number of adverse health consequences in women, including pelvic inflammatory disease (PID) and tubal factor infertility,[8–10] testing for and treatment of *M. genitalium* is not current standard of care in UK.[11]

The significance of NCNGU in men is the subject of debate,[12–16] largely due to the paucity of high-quality clinical studies. In particular, opinions are divided on whether or not to screen asymptomatic men for NCNGU. This is important in the current context of wider roll out of non-invasive sexually transmitted infection (STI) screening in settings without access to microscopy. UK and Australian guidelines for testing of STIs no longer recommend urethral smear microscopy in asymptomatic men.[11,17] Instead, there is a reliance on the presence of symptoms to indicate likely infection and the high sensitivities and specificities of non-invasive tests to detect asymptomatic infection with *C. trachomatis* and *N. gonorrhoeae*. This has led to a reduction in the number of men diagnosed with and treated for asymptomatic NCNGU and is likely to limit research on this condition in the future. However, the public health consequences of untreated asymptomatic NCNGU for men and their sexual partners are unknown.

Our study takes a systematic approach to a poorly understood but common clinical presentation. Here we systematically review the published literature to determine whether asymptomatic NCNGU, as diagnosed in routine UK clinical practice by urethral smear microscopy and negative tests for *C. trachomatis* and *N. gonorrhoeae*, is associated with significant clinical consequences in men and/or their sexual partners in order to better inform STI screening and testing policy.

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METHODS

Databases, search strategy and search terms

We searched four electronic databases (MEDLINE, EMBASE, CINAHL and PsycINFO) using terms including urethritis, non-specific, non-chlamydial, non-gonococcal, non-specific urethritis (NSU), non-gonococcal urethritis (NGU), NCNGU and non-gonococcal non-chlamydial urethritis (NGNCU) (see Appendix 1, available online only at: http://www.ijsa.rsmjournals.com/cgi/content/full/22/5/338/DC1) and included

literature published after January 1965 (the year *C. trachomatis* was first recognized as a cause of urethritis[18]) to February 2010. Results were also restricted to English language for practical reasons.

JMS screened titles and abstracts for potential relevance (based on accepted clinical knowledge of the subject[19]) and allocated them into one of two groups; 'for exclusion' or 'for further assessment to determine eligibility'. If relevance could not be assessed from the title and abstract, we obtained a full text version. The second researcher (CSE), blinded to the first researcher's initial group allocation, reviewed a random sample of 10% of the study titles in each group to assess reliability of the screening process. Any differences were resolved by discussion between the researchers and a final group of relevant articles for assessment of eligibility was agreed. In order to capture articles potentially missed by the literature search but with outcomes of relevance embedded in their text, full text articles were also retrieved for relevant references quoted in review articles and editorials on NCNGU.

Types of study included

We included studies that reported clinical outcomes for men with asymptomatic NCNGU and/or their sexual partners. Trials, observational studies, including cohort and non-comparative case series, were eligible for inclusion but we excluded case reports.

Participants

Men with asymptomatic NCNGU and sexual partners (any gender) of men with asymptomatic NCNGU.

Inclusion and exclusion criteria

Studies had to meet the following accepted definition of asymptomatic NCNGU in order to be included:

(1) Asymptomatic men with a Gram or methylene blue-stained urethral smear containing ≥5 PMNLs per high-powered field (HPF) (×1000) averaged over five fields with the greatest concentration of PMNLs, or a Gram stain of a pellet produced by centrifuge of first void urine containing ≥10 PMNL/HPF averaged over five fields with the greatest concentration of PMNLs.[19] Studies not reporting a diagnostic criteria based on microscopy were excluded. However, we did include studies using a higher threshold for detection than the ≥5 PMNL/HPF if explicitly stated. The asymptomatic status of the male index cases could be self-reported or clinician elicited;

(2) A negative urine or urethral swab nucleic acid amplification test (NAAT) or culture test for *C. trachomatis* and *N. gonorrhoeae*. Thus, studies that used enzyme immunoassay, serology or other non-NAAT, non-culture methods for detection of *C. trachomatis*, or studies that used a leukocyte esterase test to diagnose urethritis were excluded because of variable and low reported specificities and sensitivities.[20,21]

Validity

Because of the limited number of studies relating to asymptomatic NCNGU, we included all studies regardless of our assessment of validity.

Data extraction

Data were extracted by the authors independently and disagreements settled through discussion.

Outcome measures

We included any recognized clinical outcome[22] in the index male patients and/or their sexual partners including, but not restricted to, epididymitis, conjunctivitis, arthritis, infertility, PID including salpingitis and endometritis, cervicitis, diagnosis with another STI, miscarriage, premature delivery and psychological diagnoses. We also included studies that investigated the relationship between asymptomatic NGNCU and HIV seminal plasma viral load as this has been linked with enhanced HIV transmission, which we considered a relevant potential clinical outcome.[23]

RESULTS

We identified 1413 references from the search. There was an 85% agreement between reviewers of the initial screening process and we reached consensus by discussion for the remaining 15%. We retrieved full papers for 103 titles, 101 of which failed to meet the inclusion criteria leaving two eligible studies (see Figure 1 and Appendix 2 of excluded studies [available online only at http://www.ijsa.rsmjournals.com/cgi/content/full/22/5/338/DC1]). No previous systematic review was found in the Cochrane database library and no ongoing UK-funded studies were identified from the National Institute for Health Research (NIHR) clinical research network portfolio database. Three studies included asymptomatic and symptomatic men with NCNGU but did not report separate clinical outcomes for the asymptomatic group and were therefore excluded from further analysis.[4,24,25]

1. *Association of asymptomatic NCNGU with adverse health outcomes in men.*

We did not find any eligible studies reporting adverse physical or psychological health outcomes for men with asymptomatic NCNGU.

2. *Association of asymptomatic NCNGU with adverse health outcomes in sexual partners of men with the condition.*

Two studies described relevant outcomes as summarized in Table 1.[26,27] These studies investigate associations of asymptomatic NCNGU with concomitant STIs in sexual partners. *C. trachomatis* was detected in 2.4%[27] and 8.3%[26] of female partners of men with asymptomatic NCNGU. A single study also detected pathogen-negative PID in 2.4% and cervicitis in 9.4% of female partners.[27]

DISCUSSION

We identified only two studies that met the inclusion criteria for our review. The available research in this area, on which clinical guidelines are based, is insufficient in quality and breadth to enable us to draw robust conclusions on whether asymptomatic NCNGU is associated with significant health consequences for men or their sexual partners.

Where literature exists, consequences for sexual partners focus on the diagnosis of concomitant STIs in female partners.[26,27] The prevalence of *C. trachomatis* in these women ranges from 2.4%[27] to 8.3%.[26] A single study also found PID in 2.4% and cervicitis in 9.4% of sexual partners who were negative for *C. trachomatis* and *N. gonorrhoeae*.[27] It is possible that these women had

Table 1 Association of NCNGU in men and concomitant STIs in their female sexual partners

Study, setting and design	Sample	Diagnostic criterion for NCNGU	Number of partners tested/total number of sexual partners	Clinical outcomes	Validity
Manavi *et al.* (2008) GU medicine clinic, Scotland Prospective observational study	403 unselected male attendees with NCNGU	Urethritis: ≥5 PMNL/HPF (×1000) on a Gram-stained urethral smear *Neisseria gonorrhoeae*: urethral swab; culture *Chlamydia trachomatis*: either LCx or PCR assays on first void urine from men and endocervical swab from women	99 female partners/401 men with NCNGU Unreported total number of sexual partners 48 of the 99 female partners were contacts of men with asymptomatic NCNGU 51 of the 99 female partners were contacts of men with symptomatic NCNGU	In total, 19/99 (19%) of the female partners of all men with NCNGU (symptomatic and asymptomatic) were positive for *C. trachomatis*. A further 4/99 (4%) had PID and 16/99 (16%) had BV. However, data are not all disaggregated for contacts of asymptomatic NCNGU 4/48 (8.3%) female sexual partners of men with asymptomatic NCNGU were *C. trachomatis*-positive compared with 15/51 (29.4%) female sexual partners of men with symptomatic NCNGU who were *C. trachomatis*-positive ($P < 0.005$)	No statement about study power calculation A mixture of LCx and PCR is used for detection of *C. trachomatis*. There are differences in sensitivity between these two tests that may give rise to an underestimation of infection in men with NCNGU and their partners when LCx was used. However, authors state that no significant difference between the tests could be seen in this study No test for *Mycoplasma genitalium* Total number of traceable sexual partners is unreported. Therefore, the true prevalence of infection in sexual partners is unknown No confidence intervals given
Blume *et al.* (2008) GU medicine clinic, England Retrospective case note review	101 unselected male attendees with asymptomatic NCNGU	Urethritis: ≥5 PMNL/HPF (×1000) on a Gram-stained urethral smear *N. gonorrhoeae*: urethral swab; culture *C. trachomatis*: urine, urethral or cervical swab PCR assay	42 sexual partners/174 'recent' sexual partners 41/42 were female sexual partners. Only female partners attended for screening so data relate to these 41 female partners	Diagnoses in female sexual partners of men with asymptomatic NCNGU: 1/41 (2.4%, 95% CI 0.0–12.9%) *C. trachomatis*-positive 4/41 (9.4%) cervicitis 1/41 (2.4%) pathogen-negative PID 1/41 (2.4%) genital warts 1/41 (2.4%) genital herpes 1/41 (2.4%) candida 1/41 (2.4%) urinary tract infection	No statement about study power calculation No test for *M. genitalium* Partner notification rate of 0.42 per index case Only 24% of the total number of sexual partners attended for testing therefore the true prevalence of infection in partners is unknown

NCNGU – non-chlamydial non-gonococcal urethritis; STI – sexually transmitted infection; PMNL – polymorphonuclear leukocytes; HPF – high-powered field; PID – pelvic inflammatory disease; LCx – ligase chain reaction; PCR – polymerase chain reaction; GU – genitourinary; BV – bacterial vaginosis

false-negative results or *M. genitalium*-positive disease. While the identification of men with asymptomatic NCNGU may allow for contact tracing and discovery of STIs in sexual partners, the prevalence of *C. trachomatis* seen in female partners is no higher than would be reasonably expected in the general sexually active population.[28] It is difficult to know whether the prevalence of pathogen-negative PID and cervicitis detected is significantly different from the background prevalence.

Whether or not it is beneficial in public health and economic terms to redirect resources from screening asymptomatic men for NCNGU to specific STI screening programmes is unknown; no studies investigating these important issues were identified. We did not find any studies that investigated the effects of asymptomatic NCNGU on men with the condition. In particular, none addressing the psychosocial impact of asymptomatic NCNGU were found and no articles investigating the effect of asymptomatic NCNGU on HIV seminal plasma viral load were eligible for inclusion.

The studies included in this review have a number of important limitations. The total number of contactable sexual partners is only reported in the study by Blume *et al*[27] and the prevalence of infection is presented as the number of infections found in the partners attending for testing. This gives an incomplete picture of partner pathology and it is not possible to calculate the true prevalence of infection in partners without testing all sexual contacts. Neither of the included studies report whether a power calculation was performed to guide their sample size. Studies tend to include small numbers of index men and even smaller numbers of sexual partners which, again, may give rise to a false estimate of the true burden of disease in both male index cases and their sexual partners. The included studies did not apply standardized time periods between the index man last passing urine and the urethral swabs being taken. This is known to influence the yield of PMNLs per high-powered field.[29] There is also significant intra- and inter-observer variability in reading urethral smear Gram stains.[30,31] The epidemiology of infections will vary between the geographical locations of studies (Scotland and south England) and when they were conducted (between 2002 and 2007), meaning that findings are not directly transferable to current populations.

There are several limitations of the review itself. While we only included studies that give an explicit definition of microscopic urethritis (≥5 PMNL/hpf averaged over 5 fields), some studies used a higher PMNL threshold. This means that men with a lower 'grade' of urethritis may not be included, leading in turn to an over-representation of symptomatic men. The definition of asymptomatic is difficult to standardize across the studies. Men who self-report as asymptomatic may have signs of infection when examined or may have been symptomatic in the recent past. Studies not published in English were not included for practical reasons and ongoing trials may be occurring which are not on the NIHR database. It is possible that among the large number of studies on NCNGU we have missed relevant results. However, we feel that it is unlikely that we have missed significant, well-conducted, appropriately powered studies investigating clinical consequences of asymptomatic NCNGU.

Finally, it is important to highlight that this review is focused on whether asymptomatic NCNGU is associated with adverse health outcomes. Organisms such as *M. genitalium* are responsible for some cases of asymptomatic NCNGU and there is an increasing body of literature to support its role in genital tract pathology in women.[8,32] Therefore, a review looking at clinical consequences of asymptomatic *M. genitalium*-positive NCNGU may have different findings. As current provision within UK sexual health services does not provide for *M. genitalium* testing, we feel that the clinical question of relevance is whether or not asymptomatic NCNGU has significant clinical consequences, not whether *M. genitalium*-positive NCNGU has significant clinical consequences. The development of more sensitive microarrays may also find associations between other organisms not currently thought relevant and NCNGU. Again, the clinical consequences of this are currently unknown.

This review highlights the paucity of high-quality literature and lack of knowledge about asymptomatic NCNGU. The two studies identified for inclusion report rates of infection in female partners of men with this condition that are no higher than expected in the general population. However, it is important to consider the limitations of these studies when drawing conclusions about the significance of asymptomatic NCNGU and whether screening men is a useful clinical strategy. What is clearer is that current clinical guidelines are based on a limited evidence base. We feel it is unlikely that there will be any significant research into the implications of asymptomatic NCNGU in the future although we would argue that well-designed prospective studies with good follow-up of men and their partners are needed in order to better inform clinical practice. We are currently undertaking modelling work into the public health and economic implications of abandoning urethral microscopy in asymptomatic men based on assumptions around the prevalence of *M. genitalium* and its potential pathogenicity. We are also investigating the clinical and behavioural factors associated with a diagnosis of asymptomatic NCNGU in men attending sexual health services in order to identify whether these men are at risk of other STIs.

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